JPRS 76490

25 September 1980

China Report

SCIENCE AND TECHNOLOGY

No. 58

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SEVERAL SUGGESTIONS ON BUILDING A SCIENTIFIC, TECHNOLOGICAL BASE

Tianjin TIANJIN RIBAO in Chinese 23 Jul 80 p 2

[Article by Pan Yusheng [3382 7183 3932] of the Tianjin Municipal Institute of Petrochemical Industry]

[Text] I. Tianjin needs to plan to build a "scientific education center" (or "satellite city for scientific education"). During the 24 years I was in Beijing, I saw the completion and development of "Zhongguan Cun" (the site of the Academy of Sciences), a scientific education center in Beijing. I am deeply impressed and appreciate the role it has played in promoting the development of scientific education of Beijing and academic exchange at home and with other countries. Most of the important institutes of the Chinese Academy of Sciences are there, plus neighboring Qinghua University, Beijing University and the Scientific and Technological Library of the Academy of Sciences. Our former unit was located close to Zhongguan Cun, and we had easy access to each other's equipment, academic activities and scientific literature and information. It was very convenient for us to seek advice from specialists on difficult problems and learn about new scientific findings and accomplishments. After returning to Tianjin, I found the situation completely different. Scattered far and wide all over town, the research institutes are so independent and isolated that contact is very difficult. For instance, the institute where I work, the Tianjin Municipal Institute of Petrochemical Industry, is located at the Chenglin-zhuang Industrial Zone in the eastern suburbs of the city, and there is no other institute nearby. Because it is newly established, we often need to contact outside sources for help. Each time we go to the municipal people's library to check references or to the Science Auditorium for academic events, we have to spend more than 2 1/2 hours for the round trip. It is even more difficult to contact other fraternal institutes. Since scientific research depends on exchange and cooperation, we suggest that a "scientific education center" be included in the overall city plan of Tianjin. In my opinion the area near the waterfront park is worth considering. Peaceful and quiet, the locality has enough room for growth, is not too far from the center of the city and is close to important higher educational institutes such as Nankai University and Tianjin University.

II. The Municipal Science Committee should be in charge of "the scientific and technological information center," a "center for unified coordination and management of scientific research institutes," an "analysis and testing center," and a "scientific supply and service center." Generally speaking, the scientific research institutes in Tianjin are rather weak compared with those in Beijing, and therefore require unified management, cooperation and efficient research support. The municipal people's library could be a starting point for the "information center," which would organize the city's various scientific disciplines and information workers into a united, city-wide scientific and technical information network. A "scientific and technological information search center" and a Tianjin scientific and technological library" for the whole city would be established at the future "scientific education center." The main functions of the "management center" are to consult the various bureaus to organize, deploy, coordinate and inspect implementation of key city-wide research projects and to organize facilities to assess, check, accept, report to the higher authorities and to popularize research achievements. The "analysis and testing center" is a research institute charged with the exclusive responsibility to introduce, selectively test and put to use imported large advanced analysis instruments. The advantage of this arrangement is that it provides a way to use Tianjin's foreign exchange in an integrated manner--based on investigation and research--should the various units be short of foreign exchange, in order to import world-class large-scale modern physical analysis instruments such as color spectra--mass spectra [computers], "Laser Raman spectrometers," etc. A single research institute usually does not have enough foreign exchange to import these large instruments and has inadequate technological capability; the instruments have a low utilization rate. When "the center" imports them, it has specialists to test, oversee, maintain, repair and use them. Units can entrust it with running them for greatly enhanced efficiency. The "service center" may use a "Tianjin Scientific Instrument Company" as a base to expand its service coverage to all the institutes to unify and coordinate planning, supply and demand, and distribution of the scientific instruments. It may also adjust the surplusses and deficiencies of the institutes to meet their urgent needs.

III. Further enlarge and improve academic exchange activities: Today, even though there are many academic societies and their branches in Tianjin, academic activities still trail behind those in Beijing. Take analytical chemistry for example. In view of the fast development of liquid chromatography, Beijing organized a seminar on liquid chromatography 2 years ago. Specialists from all the institutes gathered and agreed on the series to be given by them individually for half a day each week, plus discussions of related subjects, tours and exchanges of information. The course lasted several months and all those who participated found it quite rewarding. This year, Tianjin started to give a simple introduction to liquid chromatography, but academic activities still trail scientific research needs. Actually, Tianjin has its own specialities. The chromatographic reagents and fixing agents of the Second Reagent Plant are well known throughout China. There is another good tradition in Beijing: information is "circulated" by the import and export companies about importation of any new and large instruments by any institute where foreign technicians come to install, test and discuss them to all fraternal units very quickly. This enables their specialists in the field to avail themselves of the opportunity to attend the sessions. I sincerely hope that our city follows this good example to organize academic seminars, promote exchange of scientific information and encourage discussions and cooperation. This is a vital link in speeding up the establishment of a "scientific and technological base" in our city.

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BRIEFS

JIANGSU EARTHQUAKE RUMORS--There have been rumors recently about an imminent earthquake in Jiangsu. In this connection, a responsible comrade of the Jiangsu Provincial Seismological Bureau said that the bureau had so far monitored no sign of an imminent destructive earthquake in the province. He pointed out that the information about earthquakes carried recently in newspapers and over broadcasts was aimed solely at disseminating such information to the masses so that they would be able to minimize losses if an earthquake occurred. He added that research in earthquake forecasting, whether in China or abroad, was still in the exploratory stage, and that the report that a foreign country had forecast an imminent destructive earthquake in Jiangsu was entirely groundless. [OW041709 Nanjing Jiangsu Provincial Service in Mandarin 2300 GMT 2 Sep 80 OW]

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APPLIED SCIENCES

COMPUTER OUTLOOK: STRESS ON BUYING TECHNOLOGY, NOT MACHINE

Beijing GUANGMING RIBAO in Chinese 1 Aug 80 p 4

[Article by Ji Zong [4764 1350]: "Technical Policy Problems in Developing Our Country's Electronic Computer Industry"]

[Text] Beginning by summarizing the practical experience of over 20 years of China's electronic computer industry and giving specific considerations to the present actual situations in that industry, we put forth the following ideas on technical policy with the hope that they will attract the attention and joint study of all those involved.

1. Combine large, medium and small sizes, emphasize medium and small, vigorously develop microcumputers for wide applications

Since the realization of integrated circuits, today's electronic computers, with their greatly reduced bulk, reduced costs and improved reliability, have achieved the physical basis for broadened popular applications. Small and medium sized computers are among the most widely used today and constitute over 90 percent of all computers assembled. Mircrocomputers, which first appeared in the early 70's, are now widely used throughout society. Accumulated experience and personnel trained in microcomputers create more favorable conditions for the production and utilization of even more sophisticated computers. Naturally, the development of large computers is indispensable in carrying out China's four modernization. Thus, the interrelations of large, medium, small and micro computers, and their popularization and escalation, must be managed soundly.

2. Develop [serially manufactured] computers, achieve multiple use of the same machine and common use of many machines

Due to various reasons, the early development of China's electronic computer industry had gone astray by focusing its attention on single-machine systems and emphasizing singular technologies while neglecting the standardization, interchangeability and serialization of computers. Consequently, the compatibility of various machines and the continuation in production and application were very poor, and, as a result, what could have been a faster development in China's computer industry was impeded. Serialized computers have many distinct advantage among various computers of the same generation, software of small machines can be run on large machines and software of large machines is an expanded version of small machine software. Software produced by users at the expense of great manpower will not be rendered useless upon the switch to a new machine. Serialized computers have successfully solved the continuation problems in production and application. They are therefore advantageous with regard to manufacture, broadened usage, centralized repair and maintenance, training of operators and maintenance personnel and speedy development of software.

3. Ensure adequate accessories, strengthen technical services

Computer systems encounter different demands in different applications. Facing the users, the computer industry needs to put great effort in developing various kinds of peripherals, especially intelligent terminals, to provide the users with complete computer services at various levels with sufficient accessories which come with the machine and adequate software, maintenance tools, spare parts and supplemental facilities. Since it takes people with special training to run the machines, application departments such as technical services divisions and software centers are established within the computer industry to aid the users through the training of operators and maintenance men, through the installation and repair of machines, application system designs and software development. The users can then concentrate their efforts on developing the applications in their fields without the need to keep skilled technical personnel and to be concerned with their operation and maintainees training.

4. Make efforts to improve the quality of computers made in China and continue to reduce costs.

Through better business organization and management, improved manufacturing technology and better product quality, we must provide the various organizations in China which are urgently in need of electronic computers with computer systems of higher quality and raise the competitiveness of Chinese-made computers. For this reason, we suggest importing a certain amount of the elements, parts and peripherals which are temporarily not available in China and those not up to standard in quality or economically unfeasible to produce in China. By doing so, we can raise the quality of Chinese-made computers and reduce their costs at a faster pace.

5. Introduce advanced foreign manufacturing technologies instead of blindly buying their machines.

In order to change the backward state of our computer industry and to reverse the situation of importing computers in large quantities, we must make great effort in reforming our country's computer industry and introduce the necessary manufacturing techniques and key production facilities. We must thoroughly change the wrong practice of the past when we were only buying the machine and not the technology.

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TITLE: "Development and Prospect of Space Electronics (I)"

SOURCE: Beijing DIANZI KEXUE JISHU [ELECTRONIC SCIENCE AND TECHNOLOGY] in Chinese No 8, Aug 80 pp 2-5

ABSTRACT: This paper sums up space electronics into the radio electronic technologies used in realization of tracking and controlling of satellites and space vehicles, in satellite observation of the earth, space probing, and satellite communication broadcasting, and in positioning moving objects on earth with satellites. Outstanding achievements of space electronics in recent years are discussed and the special characteristics of the field analysed. The general condition of development of space electronics in China is briefly introduced, and finally future development in space electronics is briefly predicted.
This paper is a reprint from DIANZI XUEBAO No 2, 1980.

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TITLE: "Method of Realising Modulation of Digital Echo-wave"

SOURCE: Beijing DIANZI KEXUE JISHU [ELECTRONIC SCIENCE AND TECHNOLOGY] in Chinese No 8, Aug 80 pp 6-10, 47

ABSTRACT: This paper analyses the time-division characteristic of digital echo-wave signal sequence. Based upon this characteristic, a general method of designing the time-delay line and the limiter resistor of the digital echo-wave modulator is derived. When this method is adopted, the time-delay line and the limiter resistor may be made simpler and a satisfactory result may be obtained.

AUTHOR: HE Xiaoting [0149 1420 5312]

ORG: None

TITLE: "Mutual Interference of Microstrip Transmission Lines"

SOURCE: Beijing DIANZI KEXUE JISHU [ELECTRONIC SCIENCE AND TECHNOLOGY] in Chinese No 8, Aug 80 pp 11-16

ABSTRACT: This paper describes the phenomenon of mutual interference [cross-stalking] of microstrip transmission lines. The reasons for the occurrence of mutual interference are discussed. The various types of mutual interference are classified and defined, and the necessary analysis and computation of the quantity of interference given. Finally, measures for reducing mutual interference are suggested.

AUTHOR: HE Xinqian [0149 2450 5340]

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TITLE: "Theory and Direction of Development of Encased Digital Magnetic Tapes"

SOURCE: Beijing DIANZI KEXUE JISHU [ELECTRONIC SCIENCE AND TECHNOLOGY] in Chinese No 8, Aug 80 pp 17-21

ABSTRACT: Encased digital magnetic tape evolves from the Philip cassette recording tape of the late 1960's. In the early stage, it was not very reliable, and there were frequent problems. In 1971-72, the digital cassette, i.e. the so-called cartridge magnetic tape machine, specially designed for the use of computers appeared. Today, both types of encased magnetic tape machines are being rapidly developed and extensively applied in peripheral equipment of microcomputers, terminals, digital communication, data gathering, instruments, and meters, etc.

AUTHOR: WU Hengxian [0702 1854 7359]
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ORG: Both of Shanghai Research Institute of Optics and Precision Instruments Chinese Academy of Sciences

TITLE: "Ion Injection Semiconductor Laser Annealing Device"

SOURCE: Beijing DIANZI KEXUE JISHU [ELECTRONIC SCIENCE AND TECHNOLOGY] in Chinese No 8, Aug 80 pp 22-24, 29

ABSTRACT: When damages occur to a semiconductor after ion injection, annealing process is needed to treat it to activate the injected impurity in the semiconductor and at the same time to restore the damaged crystal lattice of the semiconductor (silicon or gallium arsenate)so that the layer containing the impurity may have the desired electrical property. A method is needed to proceed with annealing of the injected layer under a room temperature, or slightly higher environment to cause the damage to the crystal to recover but to cause no damage to the underlining material. In the most recent years, there has been a great deal of research on the use of laser annealing for this purpose in the USA, USSR, etc. With the cooperation of Shanghai Institute of Metallurgy, the authors made a ruby laser (a neodymium glass laser may be used as a substitute) and carried out a successful laser annealing experiment on silicon injected Bi^+, B^+, gallium arsenate injected Sn^{119}, etc. Preliminary results of experiments on extension growth of semiconductor and ohm contact, etc. are also reported.

AUTHOR: XI Weide [1598 0251 1795]

ORG: None

TITLE: "Infrared Photoelectric Reversible Counter"

SOURCE: Beijing DIANZI KEXUE JISHU [ELECTRONIC SCIENCE AND TECHNOLOGY] in Chinese No 8, Aug 80 pp 25-27

ABSTRACT: In connection with fulfilling needs of scientific research projects, the author and colleagues made an infrared photoelectric reversible counter. It is a device of automatic detection and measurement using the theory of infrared technology to identify and count the direction and the quantity of the motion of a moving object. It is composed of the infrared detector, direction identification, and the reversible counter. The theory of the 3 components and their circuit diagrams are described.

AUTHOR: FAN Jianshun [5400 1696 7311]

ORG: None

TITLE: "Introducing a New Variable Electromagnetic Delay Component"

SOURCE: Beijing DIANZI KEXUE JISHU [ELECTRONIC SCIENCE AND TECHNOLOGY] in Chinese No 8, Aug 80 pp 33, 5

ABSTRACT: With the rapid development of electronic industry, occasions for the use of electromagnetic delay components are increasing and their requirements are becoming higher and higher. The ordinary variable delay components may be connected according to the traditional method, of course, but some common problems will occur. Based upon the experience of the author and his colleagues, this paper describes these common problems and 2 methods of improving them. Finally, if the use frequency is relatively high and requirement strict, the adoption of a fixed impedance micro-modulation delay component is recommended. It will, theoretically, overcome the above mentioned shortcomings. It is now being produced by Hangzhou Radio Component Plant, and is given the name of YT-250-0-50 fixed impedance micro-modulation delay component. Its major technical indices and a photo depicting its various parts are included.

AUTHOR: ZHAO Baojing [6392 0202 4842]
LU Minfeng [6424 3046 1496]

ORG: None

TITLE: "Introducing Chinese Make TTL Digital Integrated Circuit Series Products (VI)--Intermediate Scale Shift Storage Unit and Other Products"

SOURCE: Beijing DIANZI KEXUE JISHU [ELECTRONIC SCIENCE AND TECHNOLOGY] in Chinese No 8, Aug 80 pp 44-47

ABSTRACT: The logic circuit diagrams, the work theory, the property characteristics, and the applications of 2 4-position shift storage units, T453 and T454, and 3 8-position shift units, T456, T458, and T457 are described, without mentioning the manufacturer. The log-2 logrithum converter made and designed by Shanghai Electronic Component Second Plant is briefly introduced. Silicon rectifier components of ZP, KP, KK types made by Beijing Chunshu Rectifier Plant and other rectifying equipment produced by this plant are briefly mentioned.

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CSO: 4009

AUTHOR: YIN Ming [1438 6900]

ORG: None

TITLE: "Remote Sensing"

SOURCE: Beijing DIANZI SHIJIE [ELECTRONIC' WORLD] in Chinese No 8, 80 pp 2-4

ABSTRACT: Remote sensing is the use of instruments placed in space to monitor and measure the earth environment of the ground surface, the oceans, and the atmosphere. In 1972, the USA successfully launched an earth resources technology satellite and it brought back a large quantity of ground surface images of the entire world. Since then, more than 100 countries and regions are developing this activity of remote sensing. The use of electromagnetic wave to transmit information, the remote sensing platform in the space carrying remote sensing instruments, image formation by scanning, side-view radar, processing and treatment of the image data recorded by remote sensing instruments, and the technique of reading the images are discussed.

AUTHOR: TONG Ying [4547 5491]

ORG: None

TITLE: "Eyes for Developing the Ocean--Underwater Television"

SOURCE: Beijing DIANZI SHIJIE [ELECTRONICS WORLD] in Chinese No 8, 80 pp4-6

ABSTRACT: In the struggle to conquer the seas, underwater television serves as our eyes to see all the treasures of the oceans, which occupy 70 percent of the earth's surface. This paper describes the structure, types, applications, and development of underwater television. In a small column attached to the end of the paper, the SSX-200 underwater television designed and produced by Xiamen Electronic Instrument Plant, capable of working in oceans, lakes, rivers, and reservoirs, where the water is less than 200m in depth is reported. Drawings depicting the structure and the work procedure of underwater television are given.

AUTHOR: QI Pin [7871 0365]

ORG: None

TITLE: "Automobile Electronics"

SOURCE: Beijing DIANZI SHIJIE [ELECTRONICS WORLD] in Chinese No 8, 80 p 7

ABSTRACT: The automobile is a convenient device and the most commonly used tool of land transportation, but it is still not very satisfactory. It is not very safe, its engine makes too much noise, and it discharges a large quantity of gaseous exhaust. There have been many attempts to reconstruct the automobile with electronic monitoring and control technology. Electronic instruments being studied for improving automobiles include the following 3 aspects: (1) Devices for monitoring the condition of the driver to detect such condition as being drunk, falling asleep, etc. (2) Security devices, such as electronic lock, burglary alarm, etc. (3) Collision preventive devices, including collision preventive radar and automatic brakes. This paper includes a brief discussion of attempts of using electronics to improve automobiles. A drawing of an automobile is given to depict the locations where these electronic devices may possibly be installed.

AUTHOR: YUAN Shuren [5913 2885 0088]

ORG: None

TITLE: "Silver Oxide Button-like Batteries"

SOURCE: Beijing DIANZI SHIJIE [ELECTRONICS WORLD] in Chinese No 8, 80 p 11

ABSTRACT: Today's pocket-size calculators and electronic watches operate on silver oxide cells that look like a button. This paper explains the way silver oxide cells are made and they come in 4 diameters and 5 thicknesses and the user must choose the right type when a replacement is needed. The paper also cautions against using metal pincers to handle silver oxide batteries or incinerating used silver oxide batteries.

AUTHOR: REN Shilong [0117 0013 7127]
ZHANG Nunquan [1728 3387 2164]

ORG: None

TITLE: "Semiconductor Circuit Knowledge (VI): Exposing the Secret of Low Frequency Power Amplifier (I)"

SOURCE: Beijing DIANZI SHIJIE [ELECTRONICS WORLD] in Chinese No 8, 80 pp20-21

ABSTRACT: The final stage output of radio receivers and loudspeakers must be in a specified voltage and current; therefore, it is also called power amplifier. Due to the fact that the signals are in audio frequencies, they are also called low frequency amplifiers, which may generally be divided into 3 types. This installment of the paper introduces briefly the A type one tube [transistor] power amplifier and the B type push-pull power amplifier. The circuit structure and the work principle of both types are described, with the B type in more detail than the A type.

AUTHOR: (1) WU Baogang [0702 1405 0474]
(2) GUO Chaobin [6751 2600 2430]
(3) WANG Guoren [3769 0948 0088]
(4) None

ORG: None

TITLE: "Reform and Application"

SOURCE: Beijing DIANZI SHIJIE [ELECTRONICS WORLD] in Chinese No 8, 80 pp 27-28

ABSTRACT: This column contains 4 items. The third item listed in the table of contents, SSX-200 Underwater Television is missing in the column. (1) Ultrasonic wave and its application: A definition of ultrasonic wave, the history of its discovery, and its industrial applications are briefly discussed. (2) Automatic protection device for thyristor [silicon controlled rectifier] battery charger: A circuit capable of effectively improving the overload capability of thyristor is introduced. (3) Simple open-phase protective circuits: Three types are very briefly introduced. (4) Transistor ignition devices: Two types, made respectively by Sichuan Mianyang State-operated Peijiang Wire Electric Plant Electronic Instrument Branch and State-operated Huafeng Radio Electrical Instrument Plant are introduced. Both are intended as an accessory to the ignition system of the automobile.

AUTHOR: XU Yiqian [1776 5135 6197]
YAO Weiwen [1202 0251 2429]
FANG Qiuhua [2455 4428 5478]

ORG: None

TITLE: "Studies on JS-1 MHD Generation Experimental Installation"

SOURCE: Nanjing NANJING GONGXUEYUAN XUEBAO [JOURNAL OF NANJING INSTITUTE OF TECHNOLOGY] in Chinese Special Edition No 3, 1979 pp 1-13

TEXT OF ENGLISH ABSTRACT: This paper gives a comprehensive picture of the studies conducted on a model MHD generation experimental installation consisting of MHD generator, inverter, condenser, high-temperature air preheater, seed-recovery equipment, measuring facility and steam generator. Some of the experimental results obtained on the given installation since 1969 are also presented.

AUTHOR: None

ORG: Generator Section, Research Laboratory of MHD Generation

TITLE: "Experimental Investigation of Faraday MHD Generator"

SOURCE: Nanjing NANJING GONGXUEYUAN XUEBAO [JOURNAL OF NANJING INSTITUTE OF TECHNOLOGY] in Chinese Special Edition No 3, 1979 pp 14-22

TEXT OF ENGLISH ABSTRACT: The construction of the No 3 channel for the JS-1 MHD generator and some experimental investigations on this channel are described. The results of experimental investigations described in this paper include: (1) the problem of reasonable organization of flowing conditions; (2) pressure, velocity and temperature distributions along the channel; (3) the insulating properties of the channel; (4) the voltage drop across the electrode boundary layer; (5) the open-circuit voltage, short-circuit current and power distributions along the channel; (6) the ratio of extractive power to ideal power; (7) effect of seed on the insulating property and durability of magnesite bricks in the channel.

AUTHOR: FANG Yilin [2455 0001 7792]

ORG.: None

TITLE: "Calculation and Analysis for the Electrical Performance of Faraday MHD Generator"

SOURCE: Nanjing NANJING GONGXUEYUAN XUEBAO [JOURNAL OF NANJING INSTITUTE OF TECHNOLOGY] in Chinese Special Edition No 3, 1979 pp 23-28

TEXT OF ENGLISH ABSTRACT: This paper analyzes the effects of several factors on the power output, including load coefficient, voltage drop in electrode boundary layer, electrode resistance, axial and transverse leakage current and finite segmentation of electrodes.

A formula for calculating power output is derived. It also indicates the minimum requirements for the different factors as mentioned above that must be met in order to limit their effects on power output to a given value.

AUTHOR: CHEN Xiuhua [7115 4423 5478]
WAN Caichun [8001 2088 2504]
YAO Chunli [1202 2504 7787]
FANG Qiuhua [2455 4428 5478]

ORG.: None

TITLE: "Gas Velocity Measurement in MHD Generator"

SOURCE: Nanjing NANJING GONGXUEYUAN XUEBAO [JOURNAL OF NANJING INSTITUTE OF TECHNOLOGY] in Chinese Special Edition No 3, 1979 pp 29-35

TEXT OF ENGLISH ABSTRACT: For gas flow at high temperature and high speed in MHD-channel, a method of measuring gas velocity without physical contact is discussed in this paper. The random perturbations which exist in the MHD-channel are used as information to measure the speed of gas flow in the channel. Based upon the principle of correlation of random signals we have constructed equipment to measure the difference of time between two measuring points. In the paper the correlative principle of measuring speed is explained and the block diagram is given. The block diagram and circuit diagram are given in detail for another piece of equipment which measutes the avetage difference of time without correlation. The measured results and the analysis of errors are also given.

AUTHOR: ZHAO Yiyu [6392 0110 6877]
WAN Caichun [8001 2088 2504]
ZHOU Peijun [0719 0012 6874]
DAI Liming [2071 4539 6900]
GONG Lenian [7895 2867 1628]

ORG: None

TITLE: "Active Inverter for Faraday Type MHD-Generator"

SOURCE: Nanjing NANJING GONGXUEYUAN XUEBAO [JOURNAL OF NANJING INSTITUTE OF TECHNOLOGY] in Chinese Special Edition No 3, 1979 pp 36-41

TEXT OF ENGLISH ABSTRACT: The schemes of the main circuit and the control system of the active inverter connected to a JS-1 Faraday type MHD-generator electrode-pair are described. The features of the inverter and the design considerations are pointed out and illustrated by experimental results.

AUTHOR: ZHAO Yiyu [6392 0110 6877]

ORG: None

TITLE: "Calculation of Static Parameters of Inverter for Faraday Type MHD Generator"

SOURCE: Nanjing NANJING GONGXUEYUAN XUEBAO [JOURNAL OF NANJING INSTITUTE OF TECHNOLOGY] in Chinese Special Edition No 3, 1979 pp 42-47

TEXT OF ENGLISH ABSTRACT: This paper presents a method of calculation for the static parameters of an inverter which takes into consideration the fact that the equivalent internal resistance in the MHD generator is high. The effects of parameter variation on the performance of the inverter are also discussed.

AUTHOR: XU Huaqin [5685 5478 2951]
LIU Qianxin [0491 0667 9515]
LIU Chuanbo [0491 0278 0590]
JIN Wanmin [6855 8001 2606]

ORG: None

TITLE: "Design and Experimental Study of the High Temperature Pebble-Bed Air Preheater"

SOURCE: Nanjing NANJING GONGXUEYUAN XUEBAO [JOURNAL OF NANJING INSTITUTE OF TECHNOLOGY] in Chinese Special Edition No 3, 1979 pp 48-59

TEXT OF ENGLISH ABSTRACT: The first high temperature stationary matrix pebble-bed regenerative air preheater in our country designed and built in 1971 is described in this paper. The preheater, with an air outlet temperature of 1550-1600°C and a rate of temperature drop of 1.5°C/min, satisfies the requirements of MHD power generation. From our test results, the performance characteristics of the preheater are as follows: the empty-tube air velocity--0.65 Nm/s; temperature of the discharged gas--250°C; overall heat transmission coefficient--12-20 Kcal/m^2 · °C per cycle; and maximum gas pressure drop across the bed--1000 mm H_2O. It is shown that the pebble-bed preheater is correctly designed, and the methods of calculation and the design constants adopted are suitable.

AUTHOR: ZHANG Mingyao [4545 0682 5069]
CHEN Xiangyong [7115 4382 2837]
ZHANG Mujin [1728 1970 3866]
TANG Huifen [0781 1979 5358]

ORG: None

TITLE: "The Combustor of JS-1 MHD Installation"

SOURCE: Nanjing NANJING GONGXUEYUAN XUEBAO [JOURNAL OF NANJING INSTITUTE OF TECHNOLOGY] in Chinese Special Edition No 3, 1979 pp 60-68

TEXT OF ENGLISH ABSTRACT: In this paper the construction of the hot-wall type combustor in a small-scale MHD plant and the experimental study carried out on it are described. In the burner, compressed air is used as the atomizing medium, light diesel oil as the fuel, and high-temperature preheated air at 1520-1750°K as the oxidant. Heat loss of the combustor is estimated to be below 3 percent, and the degree of complete combustion is almost perfect. The corresponding temperature of the products of combustion ranges over 2570-2700°K at the inlet of the MHD generator. The results of measurements on the temperature of the hot gas, the composition of the products of combustion, the losses, etc., are also listed.

AUTHOR: WANG Shimin [3769 1709 3046]

ORG: None

TITLE: "Temperature Measurement of High-Temperature Flame in MHD Generator"

SOURCE: Nanjing NANJING GONGXUEYUAN XUEBAO [JOURNAL OF NANJING INSTITUTE OF TECHNOLOGY] in Chinese Special Edition No 3, 1979 pp 69-75

TEXT OF ENGLISH ABSTRACT: An experimental device is developed for measuring the temperature of high-temperature flame in the MHD generator. The basic principles, the construction and the method of operation of the device are described. An analysis of its errors is given. Some problems for further research are pointed out at the end of the paper.

AUTHOR: LI Daji [2621 1129 7535]

ORG: None

TITLE: "A New Seeding Material for MHD Generation"

SOURCE: Nanjing NANJING GONGXUEYUAN XUEBAO [JOURNAL OF NANJING INSTITUTE OF TECHNOLOGY] in Chinese Special Edition No 3, 1979 pp 76-81

TEXT OF ENGLISH ABSTRACT: In this paper it is proposed to use "mixed soda"--the waste liquid from the industrial production of lithium salts, as an additive in a large-scale MHD-steam power station. Theoretical analysis and experimental results on this material are presented.

AUTHOR: None

ORG: The Research Institute of Nanjing Chemical Industry Company

TITLE: "Seed Recovery Technique for MHD Generation"

SOURCE: Nanjing NANJING GONGXUEYUAN XUEBAO [JOURNAL OF NANJING INSTITUTE OF TECHNOLOGY] in Chinese Special Edition No 3, 1979 pp 82-89

TEXT OF ENGLISH ABSTRACT: This paper gives a general review of the previous research works on low temperature seed recovery in foreign countries, and also describes the seed recovery process, equipment, operating conditions and the purification index attained by the "spray-cup absorber-sieve-plate absorber-venturi scrubber" system which has been mounted in the NTI JS-1 model installation.

Tests on the wet electrostatic precipitator are also described and the practical application of the solubility isotherm diagram of K_2CO_3-$KHCO_3$-K_2SO_4-H_2O system to wet seed recovery process is also discussed.

AUTHOR: JIANG Chizhi [5592 2170 1807]
LI Fuan [2621 4395 1344]
JIANG Lianmu [5592 6647 2976]

ORG: None

TITLE: "Research on a Fluidized Boiler Used in MHD-Steam Power Plant"

SOURCE: Nanjing NANJING GONGXUEYUAN XUEBAO [JOURNAL OF NANJING INSTITUTE OF TECHNOLOGY] in Chinese Special Edition No 3, 1979 pp 90-100

TEXT OF ENGLISH ABSTRACT: The research on an experimental steam boiler used in a MHD-steam power plant is described. The international state of the art on the topic is also presented.

It is noticed that the agglutinating and blocking on the wall of the boiler at temperatures of 800-1200°C is a critical problem for the design of the boiler. A fluidizing technique offers a solution to this problem.

The construction of the fluidized boiler and the test results are also presented.

AUTHOR: JIANG Chizhi [5592 2170 1807]

ORG: None

TITLE: "Calculation of the Combined Cycle Efficiency for Large-scale MHD-Steam Power Generation"

SOURCE: Nanjing NANJING GONGXUEYUAN XUEBAO [JOURNAL OF NANJING INSTITUTE OF TECHNOLOGY] in Chinese Special Edition No 1, 1979 pp 101-108

TEXT OF ENGLISH ABSTRACT: This paper introduces the results of calculation of the combined cycle efficiency for large-scale MHD-steam power generation which uses mazout and coal respectively as fuels. The difficulties of burning coal are discussed. Results of calculation are compared with the corresponding calculation from abroad, and it is pointed out that the combined cycle efficiency of MHD-steam generation exceeds 50 percent in all cases for stations in the order of thousands of MW using preheated air as the oxidizer. Thus, MHD generation is a practical way of raising the efficiency of the utilization of coal.

9717
CSO: 4009

AUTHORS: CHEN Yuanmou [7115 6678 6180]
YI Jianru [2496 0113 1172]

ORG: None

TITLE: "Trains Speeding over the Silk Road"

SOURCE: Beijing DILI ZHISHI [GEOGRAPHICAL KNOWLEDGE] in Chinese, No 6 Jun 80 pp 1-2, 22

ABSTRACT: The authors describe the newly completed Turfan-Ku-er-le railway, which becomes the second main railway line in Sinjiang province. Starting from Turfan in the Lanzhou-Urumqi railway, the railway runs southward through Yu-er-gou, Baluntai, Hejing, Yenshi to reach Ku-er-le, at the northern edge of the Tarim Basin, and has an overall length of 476 kilometers. The description emphasizes the geographical and economical significance of the railway that will greatly improve the communications between the norther and southern Tianshan areas, and promote the interflow of commodities between Chinese inland and her border region.

AUTHOR: MAO Xiaolan [0602 2556 1526]

ORG: None

TITLE: " Wild Edible Fungi of China"

SOURCE: Beijing DILI ZHISHI [GEOGRAPHICAL KNOWLEDGE] in Chinese, No 6 Jun 80 pp 3-5

ABSTRACT: Following an introduction to the occurrence, habit and characteristics of some species of well known wild, edible mushrooms from northeastern China, regions north of Zhangjiakou in Hebei province, Fujian province, southwestern China, Gobi desert, and Chinghai and Tibetan plateau, the author discusses the importance of conducting further investigation and studies of this natural resources in China for further exploitation and utilization, and its significance in enriching provisions, improving people's health, and extending foreign trade. It is reported that there are more than 300 species of wild edible mushrooms in China known so far

AUTHOR: YU Xizhang [0205 6932 4545]

ORG: None

TITLE: "Chinghai Prairie's Harmful Rats"

SOURCE: Beijing DILI ZHISHI [GEOGRAPHICAL KNOWLEDGE] in Chinese, No 6 Jun 80 pp 6-7

ABSTRACT: Based on an introduction to the general features, habits, activities, and characteristic damage to grasslands of five typical rats over the Chinghai praries, namely: the plateau "rat-rabbits", the long tail barn rats, the Tibetan "rat ghosts", the Chinese zokor, and the five-toe jerboa, and the estimated annual damage they incurred, a discussion is made on the various chemical methods to control them, which should be at least 90% effective to compensate their rapid rate of propagation. Spraying of 0.2% fluoroacetamide that has proved to be 98% effective is recommended.

AUTHORS: CHEN Renjun [7115 0088 6874]
SUN Yufei [1327 3022 7378]
JIANG Muqing [5592 2606 7230]

ORG: None

TITLE: "Mt. Jiuhua - First Mountain of Southeastern China"

SOURCE: Beijing DILI ZHISHI [GEOGRAPHICAL KNOWLEDGE] in Chinese, No 6 Jun 80 pp 8-10

ABSTRACT: This article reports an excursion around Mt. Jiuhua, 20 kilometers southwest of Chingyang city in southern Anhui province, which is known throughout the Chinese history as one of the four largest Bhuddist sacred land in China. The main peak of the mountain group is 1,323 meters altitude. The report covers description of the route of the excursion, the various old Bhuddist temples, shrines and relics that scattered throughout the mountains, the inscriptions by many well-known poets, scholars and politicians throughout the centuries over the rocks, the fantastic sceneries of the mountains, peaks, clouds and rivers , as well as pine trees, and the geological formations of the mountains. The area is now under the management and protection of a "Mt. Jiuhua Park Administration".

AUTHOR: DENG Yuyou [6772 6735 0645]

ORG: None

TITLE: "A Visit to Nanwan Monkey Peninsula"

SOURCE: Beijing DILI ZHISHI [GEOGRAPHICAL KNOWLEDGE] in Chinese, No 6 Jun 80 pp 10-11

ABSTRACT: The author reports a visit to the Nanwan Peninsula, which is the only monkey protection area in China, where the near extinct Guangxi monkey species are being domesticated. The peninsula is situated at the eastern section of the Li and Miao Autonomous Chou in Hainan Island, more than ten kilometers from Lingshui County, where the climate, vegetation and terrain are ideal for their domestication. Starting from barely 50 to 60 monkeys, there are now almost 1,000 monkeys, divided into 25 groups, under the command of one monkey king. Besides protecting them from extinction, the monkeys are also the source of a very expensive ingredient of traditional Chinese medicine, a delicacy of Chinese gourmet, as well as experimental animals.

AUTHOR: ZHENG Qipu [6774 0796 3184]

ORG: None

TITLE: "A Chinese Northernmost Scientific Research Experimental Station"

SOURCE: Beijing DILI ZHISHI [GEOGRAPHICAL KNOWLEDGE] in Chinese No 6 Jun 80 p 13

ABSTRACT: The northernmost Chinese scientific research experimental station is the Frozen Earth Research Experimental Station of the Frozen Earth Research Team of the Third Prospecting Design and Planning Institute of the Ministry of Railway at the right bank of the upper reaches of the Amur River in Heilungjiang province. Besides establishment of the meteorological characteristics of the area during the last five years, it was observed that frozen earth of many years' old was about 0.5-1 meter below the ground surface, with 63 meters maximum thickness. Other research includes also such railway engineering related subjects as geological road foundation, culvert and bridge tunnels, house construction, and water supply and drainage.

AUTHORS: DU Ronghuan [2629 2827 2719]
ZHONG Dunlun [6945 2415 0243]

ORG: None

TITLE: "First National Mud Rock Flow Conference Convened at Chengdu"

SOURCE: Beijing DILI ZHISHI [GEOGRAPHICAL KNOWLEDGE] in Chinese, No 6 Jun 80 p 29

ABSTRACT: Sponsored by the Chinese Academy of Sciences, the First National Mud Rock Flow Conference was convened at Chengdu on 15-20 April 1980, and attended by representatives from 70 related units. 64 of the more than 100 research papers received on various correlated subjects were read and discussed. In addition, there were also 15 special reports and educational movies. Zhao Beiko [6392 0554 0344] deputy secretary-general of the Chinese Academy of Sciencesalso made important speech and instruction.

11,206
CSO: 4009

AUTHOR: YANG Shipu [2799 1709 3302]
HOU Hungfei [0186 7703 7378]
GAO Lianda [7559 5114 6671]
WANG Zengji [3769 1073 0679]
WU Xianghe [0702 4382 0735]

ORG: YANG of Wuhan College of Geology; HOU, GAO and WANG of the Institute of Geology, Chinese Academy of Geological Sciences; WU of the Geological Bureau of Guizhou

TITLE: "The Carboniferous System of China"

SOURCE: Beijing DIZHI XUEBAO [ACTA GEOLOGICA SINICA] in Chinese No 3, Aug 80 pp 167-175

TEXT OF ENGLISH ABSTRACT: The Carboniferous System of China is chiefly distributed in the Tienshan-Xingan geosyncline of north China, in the Changjiang paraplatform of south China and in the Kunlun-Qinling, western Yunnan-Himalaya geosynclines of western China.

Based on both the characteristics and the origin of the marine fauna, three

[Continuation of DIZHI XUEBAO No 3, Aug 80 pp 167-175]

paleobiogeographical provinces may be differentiated during the early Lower Carboniferous epoch in China: 1) South China Province (Chinese type), 2) Northern China Province (mainly Siberian-North American type), and 3) Western China Province (mixed type of south and northern China). In the later epoch of the Lower Carboniferous the three provinces seemed to have combined into unified Chinese See and formed actually a part of the extensive Tethys of eastern Asia.

A correlation of the Carboniferous within China and an intercontinental correlation of it, as well as boundaries between biostratigraphical subdivision of Carboniferous System, are discussed in this paper.

AUTHOR: PAN Jiang [3382 3068]
WANG Shitao [3769 1102 3447]
LIU Shiyu [0719 2514 7183]
GU Qichang [7357 0366 2490]
JIA Hang [6328 5300]

ORG: PAN of the Museum of Geology; WANG of the Institute of Geology, Chinese Academy of Geological Sciences; LIU, GU and JIA all of the Regional Geological Team, Geological Bureau of Ningxia Hui Autonomous Region

TITLE: "Discovery of Devonian *Bothriolepis* and *Remigolepis* in Ningxia"

SOURCE: Beijing DIZHI XUEBAO [ACTA GEOLOGICA SINICA] in Chinese No 3, Aug 80 pp 176-185

EXCERPT FROM ENGLISH ABSTRACT: Two new species of Devonian Antiarchi from the Ningxia Hui Autonomous Region, northwest China, are described.

In 1973, the Ningxia Regional Geological Team collected for the first time a few broken *Bothriolepis* plates from the Devonian red beds in Niushoushan near Country Zhongning, about 150 km southwest of Yinchuan. Further excavation at the same locality was made the next year and a great number of specimens belonging to new species of *Bothriolepis* and *Remigolepis* were found. The present

[Continuation of DIZHI XUEBAO No 3, Aug 80 pp 176-185]

Remigolepis material is the first of its kind to be discovered not only in China, but also in east Asia.

AUTHOR: SHEN Shumin [3088 3219 2404]

ORG: Institute of Geomechanics, Chinese Academy of Geological Sciences

TITLE: "A Preliminary Analysis and Model Experiments of the Stress Field of the Sinuous Type of Epsilon Structures in the Nanling Region"

SOURCE: Beijing DIZHI XUEBAO [ACTA GEOLOGICA SINICA] in Chinese No 3, Aug 80 pp 186-194

TEXT OF ENGLISH ABSTRACT: On the Chinese continent, an important feature showing regular distribution of the ε-type structures is the successive occurrence, on one and the same latitude (or longitude), of the ε-type structures with their front projecting to the south (or west) in a sinuous pattern of alignment. Judging from the mode and direction of the crust movement they manifest, such ε-type structures whould be regarded as a variety of the latitudinal or longitudinal structural belt, the morphological property of their distribution further reflecting the boundary conditions and the manner of action of the body force in the areas of their occurrence.

A series of ε-type structures in the Nanling Range region is a typical example of this group of structures. In the present paper, the distribution regularity of the sinuous ε-type structures in this region and the mechanical process of

[Continuation of DIZHI XUEBAO No 3, Aug 80 pp 186-194]

their formation are preliminarily analyzed and summarized in terms of mechanics. Mathematic deduction and model experiments on mud plates have been performed. The deformational features obtained from the model experiments on mud plates have shown a general coincidence with the field geological observations and the characteristics of the stress field determined from the above mechanical models. Thus, the theoretic interpretation and the results of the experiments have, to some extent, proved the theoretically inferred origin of the sinuous ε-type structures in the Nanling region.

AUTHOR: WU Hanquan [0702 3352 3123]

ORG: Xi'an Institute of Geology and Mineral Resources

TITLE: "The Glaucophane-schists of Eastern Qinling and Northern Qilian Mountain in China"

SOURCE: Beijing DIZHI XUEBAO [ACTA GEOLOGICA SINICA] in Chinese No 3, Aug 80 pp 195-207

TEXT OF ENGLISH ABSTRACT: The glaucophane-schists found in eastern Qinling and the northern Qilian Mountain extend for 100 and 200 km respectively. These two belts are generally associated with melanges, eclogite (c) and ultrabasic rocks, but differ to a certain extent in their mineral associations. The former consists mainly of crossite, magnesian riebeckite and albite, while the latter consists mainly of glaucophane, garnet, epidote, quartz and the common mineral chloritoid, with phengite occurring in both. It is obvious that both metamorphic belts are the products of low temperature, high pressure metamorphism. However the temperature range of the eastern Qinling metamorphic belt is rather broad while the pressure of northern Qilian Mountain is higher. Based upon the tectonic characters, stratigraphical successions, etc., it is believed that the age of plate tectonic subduction of northern Qilian Mountain was in Early Paleozoic and that of eastern Qinling in Early Mesozoic.

AUTHOR: CHEN Faling [7115 4099 2529]
WANG Defa [3769 1795 4099]

ORG: Both of Wuhan Geological College

TITLE: "Formation Types in the Tertiary Petroliferous Basins of China and Their Relations to the Distribution of Oil and Gas"

SOURCE: Beijing DIZHI XUEBAO [ACTA GEOLOGICA SINICA] in Chinese No 3, Aug 80 pp 208-218

TEXT OF ENGLISH ABSTRACT: Formations refer to rock associations closely related to each other in their origin under certain tectonic conditions. So far the following main formation types can be recognized in the Tertiary petroliferous basins in China: molasse-like formation, piedmont coarse clastic formation, red formation, volcanic formation, lacustrine carbonate formation, and alluvial plain formation. The formation types in the basins of eastern China are quite different from those found in the basins of western China. The most common formation types in the rift-valley basins of eastern China are represented by: 1) the piedmont coarse clastic and volcanic formations resulting from the initial stage of the development of basins, and the lacustrine evaporite formation from the transitional stage of the development of basins; 2) the lacustrine sand-clay formation with the sedimentary features characteristic of

[Continuation of DIZHI XUEBAO No 3, Aug 80 pp 208-218]

delta, subaqueous alluvial fan and turbidites, which developed on the active steeper side of the basin controlled by the growth faults, and the lacustrine carbonate formation found on the stable slope of the basin, both formation types representing products of the summit stage of the development of basins; and 3) the alluvial-plain formation resulting from the closing stage of development of basins. The most common formation types for the inland intermountain basins of western China are represented by both red and molasse-like formations.

The above-mentioned formation types found in the intraplate basins are controlled by such factors as: 1) the tectonic nature of basins and its change, 2) the physiographic landscape, and 3) the climatic conditions.

The development of source rocks and reservoir rocks and their salient features are closely connected with the presence of formation types. It should be noted, in particular, that the evaporite formations are favorable not only to the development of covering beds but also to the formation of salt-dome structures, which are always proved to be good traps for oil and gas accumulation.

AUTHOR: YE Qingtong [5509 1987 0681]
WU Xuehan [0702 1331 3352]
LI Mujie [2621 1970 2638]
DENG Shinong [6772 0099 0309]

ORG: YE and WU both of the Institute of Mineral Deposits, Chinese Academy of Geological Sciences; LI and DENG both of Geological Team No 723, Guangdong Bureau of Geology

TITLE: "The Genesis of the Iron Deposit in Jianshan, Guangdong"

SOURCE: Beijing DIZHI XUEBAO [ACTA GEOLOGICA SINICA] in Chinese No 3, Aug 80 pp 219-232

TEXT OF ENGLISH ABSTRACT: The characteristics of the formation of the Jianshan iron deposit is a typical example among the iron deposits of this in eastern Guangdong. The localization of the iron deposit is controlled by the contact zone of Jianshan granite and the limestones belonging to various units (from the upper part of Lower Carboniferous to the Lower Permian Qixia Formation). The ore bodies in the northeast-trending downwarps are arranged in echelons. The Jianshan granite is a small marginal stock of the Wuping-Dabagranitic batholith, and intruded in the early stage of the Yanshanian Orogeny with an isotopic

[Continuation of DIZHI XUEBAO No 3, Aug 80 pp 219-232]

(K-Ar) age of 147.3 m.y. According to the geological data and triclinity of the potash feldspar it was formed at a depth of 2-3 km and at a temperature of from 600-700°C. The iron ore is nothing but a magnetite-bearing skarn, being mineralized during one of the stages of the contact metasomatism. A series of repeated magnetizations gave rise to several generations of magnetite, which occurs in two forms, i.e., the filling-magnetite and the metasomatic type, both being formed within a temperature range of 310-560°C. Geological evidence and isotopic data suggest that the iron was derived from the various sources, including the possibility of partially sedimentary in origin, but their transporting was closely related to the action of the potash-bearing fluids.

AUTHOR: XU Xiaofeng [6079 2556 1496]

ORG: North China Metallurgic-Geologic Corporation

TITLE: "Some Petrological Characteristics of a Certain Alkali-Ultrabasic Intrusion in North China and Discussion of the Genesis of Related Iron-Phosphorus Deposits"

SOURCE: Beijing DIZHI XUEBAO [ACTA GEOLOGICA SINICA] in Chinese No 3, Aug 80 pp 233-247

TEXT OF ENGLISH ABSTRACT: The emplacement of the intrusion which occurs in the western uplift bordering the southern part of the Yanshan depression is controlled by a deep fault and the Heishansi fracture. Pyroxenitic rocks, occurring in thin layers, are found in a rhythmic multilayered lopolith near the center of the intrusive body and the iron-phosphorus ore deposits have a tendency to occur in the middle-upper part of the intrusive.

The evolution tendency of the intrusion is from alkali-ultrabasic to subalkaline and belongs to the alkali-basalt magma series. Its mineral content, oxidation coefficient, basicity and ratio of the related constituents reveal a clear rhythmic variation.

[Continuation of DIZHI XUEBAO No 3, Aug 80 pp 233-247]

The ore-forming material of the deposits is originated from an iron-phosphorus magma. The deposition of the ore is largely controlled by the volatile components and basicity of the ore magma. During the cooling of the magma a crystal field is formed, in which the crystallization sequence and characteristics of the evolved lattice structure of silicate minerals are as follows: inosilicates (ferriaugite $[SiO_3]^{-2}$) → layer silicates (Biotite $[Si_2O_5]^{2-}$) → framework of silicates (orthoclase $[Si_4O_8]^{2-}$); the evolution of cations being:

Fe^{2+}, Fe^{3+}, Mg^{2+}, Ca^{2+} → Ca^{2+}, P^{5+}, Mg^{2+}, Fe^{2+}, Fe^{3+}, Al^{3+}, K^{1+} → $K^{1+}Al^{3+}$.

The volatile components were more favorable for Al^{3+}, K^{1+}, H_2SiO_4 deposition at the upper fusion-field magma of crystallization, where alumina-silicates are formed while the iron-phosphorus ore-magma is deposited in the middle-upper part of the crystallization field.

9717
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TITLE: "Measurement of Intensity and Momentum Spectrum of Horizontal Cosmic Ray Muon at 3220 Meters Above Sea Level"

SOURCE: Beijing GAONENG WULI YU HE WULI [PHYSICA ENERGIAE FORTIS ET PHYSICA NUCLEARIS] in Chinese Vol 4 No 4, Jul 80 pp 409-412

TEXT OF ENGLISH ABSTRACT: At an altitude of 3220 meters above sea level in Yunnan, the muon intensity above 2.0 GeV/c was measured at large zenith angles (78.4-90°) by a G-M hodoscope. At mean zenith angle of 86.2°, the measured result was $(9.2 \pm 1.0) \cdot 10^{-5}$ $cm^{-2} \cdot sr^{-1} \cdot s^{-1}$.

By a magnetic cloud chamber, the muon spectrum at the same zenith angles was measured in the momentum region of 2-51 GeV/c.

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TITLE: "Identification of the Horizontal Cosmic Ray Penetrating Particles"

SOURCE: Beijing GAONENG WULI YU HE WULI [PHYSICA ENERGIAE FORTIS ET PHYSICA NUCLEARIS] in Chinese Vol 4 No 4, Jul 80 pp 413-416

TEXT OF ENGLISH ABSTRACT: An experiment using a large magnetic cloud chamber to search for new particles in horizontal cosmic rays is described. The result is: the flux of particles with unit charge $\beta < 0.7$, $m > 1$ GeV/c^2 or the flux of relativistic fractional charge particles is less than $3 \times 10^{-8} cm^{-2} sr^{-1} sec^{-1}$.

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TITLE: "Deep Inelastic Scattering Processes of the Neutrinos on Polarized Nucleons"

SOURCE: Beijing GAONENG WULI YU HE WULI [PHYSICA ENERGIAE FORTIS ET PHYSICA NUCLEARIS] in Chinese Vol 4 No 4, Jul 80 pp 417-422

TEXT OF ENGLISH ABSTRACT: By using the distribution functions of the valence quarks with definite helicities, the differential cross sections and asymmetries of the deep inelastic scattering processes of neutrinos or antineutrinos on polarized nucleons are computed.

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TITLE: "The Anti-Commutative Self-Inverse Matrices and the Transformations in Eigenvalue Problems"

SOURCE: Beijing GAONENG WULI YU HE WULI [PHYSICA ENERGIAE FORTIS ET PHYSICA NUCLEARIS] in Chinese Vol 4 No 4, Jul 80 pp 423-432

TEXT OF ENGLISH ABSTRACT: With a representation of the rotation group induced by the anti-commutative, self-inverse matrices, the transformations named by Foldy-Wouthuysen, Cini-Touschek, Chakrabarti and others are treated from a unified viewpoint. A new transformation is found. Some applications of this method in the eigenvalue problems are demonstrated.

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TITLE: "On the Probability Interpretation of the Bound State Wave Function of the Meson"

SOURCE: Beijing GAONENG WULI YU HE WULI [PHYSICA ENERGIAE FORTIS ET PHYSICA NUCLEARIS] in Chinese Vol 4 No 4, Jul 80 pp 433-439

TEXT OF ENGLISH ABSTRACT: The probability interpretation of the bound state meson wave functions is discussed by taking the 0^- meson wave function solved for the nearly flat bottom potential as an example. On the one hand, given a probability amplitude sense to the three-dimensional wave function of the meson in the configuration space obtained under the equal time limit of the four-dimensional covariant wave function solved from the B-S equation, the averaged

[Continuation of GAONENG WULI YU HE WULI Vol 4 No 4, Jul 80 pp 433-439]

radius $\langle r^2\rangle$ of the meson can be calculated. On the other hand, the electromagnetic average radius $\langle r^2\rangle$ is evaluated from the slope at the origin of the space-like electromagnetic form factor of the meson calculated directly from the four-dimensional B-S wave function. The two averaged values are compared and turn out to be in good agreement (except for the case of scalar coupling, in which the difference is about 10 percent). This shows that although the four-dimensional B-S wave function does not possess a definite sense of probability amplitude, it might, nevertheless, be plausible to give such a sense to the three-dimensional configuration space wave function of the meson obtained from the four-dimensional one under the equal time limit.

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TITLE: "The Quasi-Particle Model of Quarks and the Phase Transition in Meson States"

SOURCE: Beijing GAONENG WULI YU HE WULI [PHYSICA ENERGIAE FORTIS ET PHYSICA NUCLEARIS] in Chinese Vol 4 No 4, Jul 80 pp 440-444

TEXT OF ENGLISH ABSTRACT: A model is proposed in which a meson is considered as a collective vibrational state consisting of various quark-antiquark pairs. Whereas the quarks are quasi particles having undergone a superconductivity phase transition, there is a characteristic softening phenomenon in the meson spectrum near the critical point of phase transition. After discussing the meson states with isospin I=0 (spin S=0, 1) and I=1 (S=0) respectively, it is argued that phase transition occurred in all of them.

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TITLE: "Unitary Symmetry in Baryon-Antibaryon Systems"

SOURCE: Beijing GAONENG WULI YU HE WULI [PHYSICA ENERGIAE FORTIS ET PHYSICA NUCLEARIS] in Chinese Vol 4 No 4, Jul 80 pp 445-456

TEXT OF ENGLISH ABSTRACT: In this paper, we assume that the proton, neutron and Λ hyperon are the basic particles which belong to the fundamental triplet of the group SU_3. Thus baryonium is to be classified in the representations of SU_3. In addition, the "original" mass difference between Λ hyperon and the nucleon exhibits the violation of unitary symmetry which causes the splittings of energy levels and leads to the formations of the "unitary symmetrical energy band." The analysis in this paper of the energy levels of B-$\bar{B}$ systems shows the existence of the energy band. Furthermore, we find that the theoretical values obtained are quite consistent with the experimental ones.

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TITLE: "A Model to Calculate K-M Matrix Using Horizontal Gauge"

SOURCE: Beijing GAONENG WULI YU HE WULI [PHYSICA ENERGIAE FORTIS ET PHYSICA NUCLEARIS] in Chinese Vol 4 No 4, Jul 80 pp 455-458

TEXT OF ENGLISH ABSTRACT: A model of horizontal gauge is given, where $s_1 \approx \sqrt{2}\, m_d/m_s$ and $s_2 \approx s \approx \frac{m_s^2}{\sqrt{2}\, m_b}$ and $b \to u + W^-$ is the main decay mode of the quark b.

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TITLE: "τ Vacuum"

SOURCE: Beijing GAONENG WULI YU HE WULI [PHYSICA ENERGIAE FORTIS ET PHYSICA NUCLEARIS] in Chinese Vol 4 No 4, Jul 80 pp 459-465

TEXT OF ENGLISH ABSTRACT: While discussing the stationary soliton solutions of a real spin-less field in one spatial dimension, we notice that there exists another kind of strict solution in scalar field theory. The field's total energy, momentum and angular momentum all vanish, hence the vacuum, termed "τ vacuum," represents the zero-point vibration. Moreover, if the canonical momentum's being zero $\pi = 0$ or φ's being real is demanded, then the τ vacuum automatically gives the ordinary vacuum solutions which indicate that the symmetries are spontaneously broken. In this article, the first-order quantum-like

[Continuation of GAONENG WULI YU HE WULI Vol 4 No 4, Jul 80 pp 459-465]

solution for the φ^4 theory, Sine-Gordan theory and the L rank potential are discussed respectively. Although this kind of vacuum solution is an imaginary one, it is important for studying the vacuum's mechanism, for upon transforming it into Euclidean space it becomes the ordinary soliton solution.

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TITLE: "The Absolute Yield of the Secondary Hadrons in pp Collisions and the Rule of $I=1$ Meson Production"

SOURCE: Beijing GAONENG WULI YU HE WULI [PHYSICA ENERGIAE FORTIS ET PHYSICA NUCLEARIS] in Chinese Vol 4 No 4, Jul 80 pp 466-477

TEXT OF ENGLISH ABSTRACT: Based on the quark model of multiple production, starting from the N(Q) relation obtained by the author previously, a systematic method of calculating the absolute yield of secondary hadrons is given. After an analysis of the few data about the production of $I=1$ mesons, it is found that if the production of $I=1$ mesons has the same SU(6) broken symmetry as that of $I=0$ mesons the ratio of their yield would be 1:3. The yield of hadrons so calculated is in agreement with the experimental data. The current problem of η/ω, η'/η anomaly is also solved as a by-product.

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TITLE: "On the Wave Functions of the Nuclear Quadruple Oscillations"

SOURCE: Beijing GAONENG WULI YU HE WULI [PHYSICA ENERGIAE FORTIS ET PHYSICA NUCLEARIS] in Chinese Vol 4 No 4, Jul 80 pp 478-492

TEXT OF ENGLISH ABSTRACT: With the help of the commutation relations of the creation and annihilation operators, the wave functions for the nuclear quadruple oscillations are discussed. An explicit expression for the phonon wave functions constructed according to the group chain $U_5 \supset R_5 \supset SU_2 \otimes SU_2$ and some of their important relations are given. The unitary transformation coefficients from the basis mentioned above to the one constructed according to the group chain $U_5 \supset R_5 \supset R_3$ are also discussed. A formula for the transformation coefficients is given.

In this paper, a general formula of the multiplicity factor for given angular momentum quantum number I and seniority number P is derived and a table of the P and I values for $P \leq 30$ is given.

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TITLE: "Another New Way for Sensitizing Cellulose Acetate Solid State Track Detector--Sensitizing by Swelling"

SOURCE: Beijing GAONENG WULI YU HE WULI [PHYSICA ENERGIAE FORTIS ET PHYSICA NUCLEARIS] in Chinese Vol 4 No 4, Jul 80 pp 493-502

TEXT OF ENGLISH ABSTRACT: Swelling treatment can increase the chemical activity of cellulose and its derivatives in heterogeneous reactions. Hence we consider it possible to activate cellulose acetate solid state track detector by swelling. After testing nine sorts of cellulose acetate detector materials, we found that swelling with water could effectively increase their sensitivity, so that they could record α particles greater than 5 MeV in energy. We also found that cellulose nitrate had a similar sensitization effect.

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TITLE: "Discussion on the Methods for Treating the Pairing Correlation"

SOURCE: Beijing GAONENG WULI YU HE WULI [PHYSICA ENERGIAE FORTIS ET PHYSICA NUCLEARIS] in Chinese Vol 4 No 4, Jul 80 pp 503-509

TEXT OF ENGLISH ABSTRACT: The advantages and defects of the two methods for treating pairing correlation are discussed. Assuming that the spacing of the single-particle levels near the Fermi surface is uniform, the influences of the pairing correlation on the binding energies, the energy spectra, two-particle transfer cross section and the branching ratios are analyzed. The importance of the Pauli principle manifests itself clearly.

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TITLE: "A Note on the Theory of Single Particle Potentials"

SOURCE: Beijing GAONENG WULI YU HE WULI [PHYSICA ENERGIAE FORTIS ET PHYSICA NUCLEARIS] in Chinese Vol 4 No 4, Jul 80 pp 510-515

TEXT OF ENGLISH ABSTRACT: It is well known that corresponding to the discrete (d) and continuous (c) energy spectra of the nuclei (N+1) and (N-1), the Lehmann representation of the single particle (sp) Green function $G_{\alpha\beta}(\omega)$ may be separated into two parts:

$$G_{\alpha\beta}(\omega) = G^{d}_{\alpha\beta}(\omega) + G^{c}_{\alpha\beta}(\omega).$$

Although $G^{d}_{\alpha\beta}(\omega)$ is a meromorphic function, $G^{c}_{\alpha\beta}(\omega)$ contains branch cuts. In our previous discussion of the non-hermitian sp potential $u_{\alpha\beta} = M_{\alpha\beta}(\varepsilon_\beta)$ defined in terms of the mass operator $M_{\alpha\beta}(\omega)$, we have only considered $G^{d}_{\alpha\beta}(\omega)$ explicitly. This corresponds to a truncation approximation. In this paper, the consequences due to $G^{c}_{\alpha\beta}(\omega)$ are further investigated. It is shown that besides a few new conclusions, all the results obtained previously remain true.

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TITLE: "Relaxation of the Neutron Excess Degree of Freedom in Deep Inelastic Reactions Induced by Heavy Ions"

SOURCE: Beijing GAONENG WULI YU HE WULI [PHYSICA ENERGIAE FORTIS ET PHYSICA NUCLEARIS] in Chinese Vol 4 No 4, Jul 80 pp 516-530

TEXT OF ENGLISH ABSTRACT: The isotopic distribution for DIR yields has been obtained for very asymmetric system $^{40}Ar(E_{lab} = 263\ MeV) + {}^{238}U$. The fragment identification was done by the combination of two independent time of flight and two ΔE-E measurements.

[Continuation of GAONENG WULI YU HE WULI Vol 4 No 4, Jul 80 pp 516-530]

A simple classical model is presented to explain the experimental results for the N/Z degree of freedom. This model has also been tested for experimental results for very asymmetric systems ($^{40}Ar + {}^{197}Au$, $^{32}S + {}^{238}U$, $^{63}Cu + {}^{232}Th$ and $^{40}Ar + {}^{232}Th$) reported by other authors. The agreement between this classical calculation and all the experimental results appears to be satisfactory.

9717
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TITLE: "The Integral Representation of Analytic Functions on the Bounded Domain in C^n"

SOURCE: Xiamen XIAMEN DAXUE XUEBAO [UNIVERSITATIS AMOIENSIS ACTA SCIENTIARUM NATURALIUM, NATURAL SCIENCE EDITION] in Chinese Vol 19 No 2, 1980 pp 1-7

TEXT OF ENGLISH ABSTRACT: We can obtain the following results:
If D is a bounded domain in the space C^n, and its boundary ∂D consists of piecewise smooth orientable surfaces (or orientable differential manifolds), and can be normally divided, functions $F_{jm} \in A$, $N_j \in B$. Then for analytic functions f(z) on $\bar{D}$, we have the following integral representation:

$$f(z) = \frac{\varepsilon}{(2\pi i)^n} \sum_{j_1<\cdots<j_k} \int_{\sigma_{j_1\cdots j_k}} \frac{f(\xi)}{M^{n-k+1}} \sum_{p=1}^{k} (-1)^{k+p} \sum_{\beta_1,\cdots,\beta_{n-k}=1}^{n} \det_{(n)} (H_{j_1}, \cdots, [H_{j_p}], \cdots, H_{j_k}, N, N_{\bar{\beta}_1}, \cdots, N_{\bar{\beta}_{n-k}}) d\bar{\xi}_{\beta_1} \wedge \cdots \wedge d\bar{\xi}_{\beta_{n-k}} \wedge \wedge d\xi_1 \wedge \cdots \wedge d\xi_n, \quad (1)$$

[Continuation of XIAMEN DAXUE XUEBAO Vol 19 No 2, 1980 pp 1-7]

where $\sigma_{j_1 \cdots j_k}$ are boundary surfaces of the domain D, and are (2n-k) dimension. $\varepsilon = \pm 1$ denotes the orientation of the boundary surface.

By the above results it is easy to derive Cauchy's formula of polycylindrical domain, Bergman-Weil's integral representation, Ayzenberg's integral representation of covex domain, Temlyakov's integral representation of n-multiple circular domain, Bochner-Matinelli's integral representation and the integral representation of classical domains from integral representation.

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TITLE: "On Calculation of the Transfer Coefficients Between the Sea and the Air in Different Air Stratification"

SOURCE: Xiamen XIAMEN DAXUE XUEBAO [UNIVERSITATIS AMOIENSIS ACTA SCIENTIARUM NATURALIUM, NATURAL SCIENCE EDITION] in Chinese Vol 19 No 2, 1980 pp 17-26

TEXT OF ENGLISH ABSTRACT: A formula has been established for estimating the transfer coefficients of momentum, sensible heat and water vapor between the sea and the air in different air stratifications. A calculation has been made according to the formula of this paper for a reference surface of 10 m. The present results are compared with those obtained by using the approximate formula of Kondo et al.

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TITLE: "On Some Bionic Problems of the Compound Eyes of Insects"

SOURCE: Xiamen XIAMEN DAXUE XUEBAO [UNIVERSITATIS AMOIENSIS ACTA SCIENTIARUM NATURALIUM, NATURAL SCIENCE EDITION] in Chinese Vol 19 No 2, 1980 pp 27-36

TEXT OF ENGLISH ABSTRACT: This paper discusses how to solve the bionic problems of superposition eyes and proves that in order to superpose well the images formed by the neighboring ommatidia for the same object, the following conditions must be satisfied: (1) the optical axes of the ommatidia must intersect at the same point, and (2) the ratio of the radius of the image sphere to that of the object sphere must be equal to the transversal magnification. Examples have been given to illustrate the methods of design and calculation for an artificial superposition eye.

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TITLE: "ESR Cavity for Use at High Temperatures"

SOURCE: Xiamen XIAMEN DAXUE XUEBAO [UNIVERSITATIS AMOIENSIS ACTA SCIENTIARUM NATURALIUM, NATURAL SCIENCE EDITION] in Chinese Vol 19 No 2, 1980 pp 37-40

TEXT OF ENGLISH ABSTRACT: A low cost, easily constructed electron spin resonance (ESR) cavity for high temperature experiments is presented in this paper. The design considerations and construction of the cavity are described, and the experimental results discussed. With this cavity, sample temperatures of up to 700°K are reached without change in Q and the resonance frequency. In addition, desirable spectral line-shapes are obtained.

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TITLE: "Chemical Modeling of Biological Nitrogen Fixation. VI. Synthesis and Catalytic Activities of FeMo-co Modeling Compounds"

SOURCE: Xiamen XIAMEN DAXUE XUEBAO [UNIVERSITATIS AMOIENSIS ACTA SCIENTIARUM NATURALIUM, NATURAL SCIENCE EDITION] in Chinese Vol 19 No 2, 1980 pp 41-49

TEXT OF ENGLISH ABSTRACT: Some features of the twin-sited dicubane-cluster structural model of nitrogenase active-center previously proposed by us are discussed. Based upon this model, a method for the synthesis of FeMo-co modeling compounds has been designed. Three series of FeMo-co modeling compounds have been synthesized, with Mo:S*:Fe = 1:~6:6~8 as required by the model. Two

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complex of the citrate series, obtained by ligand exchange of the chloride series with citrate, have been found to exhibit very high catalytic activity (turnover number per Mo: 20—30 min^{-1}) and selectivity (92—95 percent C_2H_4), approaching that of FeMo-co, in the reduction of C_2H_2 to C_2H_4 by KBH_4, and to show a certain well-conditioned nitrogenase activity as assayed by Shah and Brill's method after reconstitution with Av mutant UW_{45}.

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TITLE: "Chemical Modeling of Biological Nitrogen Fixation. VII. Selective Reduction of Acetylene as a Criterion of Polynuclear Coordination of Substrates on Cluster Active-Center"

SOURCE: Xiamen XIAMEN DAXUE XUEBAO [UNIVERSITATIS AMOIENSIS ACTA SCIENTIARUM NATURALIUM, NATURAL SCIENCE EDITION] in Chinese Vol 19 No 2, 1980 pp 50-56

TEXT OF ENGLISH ABSTRACT: The catalytic activities and selectivities of FeMo-co and various nitrogenase-modeling systems in the reduction of acetylene to ethylene by KBH_4 have been compared. The high selectivities and high activities of FeMo-co (activity: turn-over number 34 min^{-1}, selectivity: 99 percent C_2H_4) and the modeling compounds synthesized in this laboratory (activity: turn-over number 20-30 min^{-1}, selectivity: 91-95 percent), in comparison with many other

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nitrogenase-modeling systems (MoO_4^{2-}-CySH, MoO_4^{2-}-CySH-Fe^{2+}, MoO_4^{2-}-insulin, $[Fe_4S_4(SCH_2\phi)_4]^{2-}$ and MoS_4^{2-}), may be regarded as a criterion indicating polynuclear coordination activation of the substrate molecules on cluster active-center of FeMo-co and of the synthetic modeling compounds.

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TITLE: "Chemical Modeling of Biological Nitrogen Fixation. VIII. The Determination of Molybdenum, Iron and Sulfur in FeMo-co Modeling Compounds"

SOURCE: Xiamen XIAMEN DAXUE XUEBAO [UNIVERSITATIS AMOIENSIS ACTA SCIENTIARUM NATURALIUM, NATURAL SCIENCE EDITION] in Chinese Vol 19 No 2, 1980 pp 57-62

TEXT OF ENGLISH ABSTRACT: A method for the determination of molybdenum, iron and sulfur in FeMo-co modeling compounds is proposed. The samples are treated consecutively with bromine, potassium chlorate and nitric acid, then evaporated almost to dryness twice with hydrochloric acid. The molybdenum and the iron are determined photometrically with the dithiol method and with the sulfosalicylic acid method respectively. The sulfur is determined photometrically with the morin-thorium method after the solution is passed through a column filled with the H-form of sulfonic-acid type cation exchanger. The method proposed is satisfactory in precision and accuracy.

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TITLE: "The Effect of 2-thiazolidinethione, Sodium Phenyldithiopropylene Sulfonate, and Chloride-ion on Copper Electrodeposition in Acidic Solution"

SOURCE: Xiamen XIAMEN DAXUE XUEBAO [UNIVERSITATIS AMOIENSIS ACTA SCIENTIARUM NATURALIUM, NATURAL SCIENCE EDITION] in Chinese Vol 19 No 2, 1980 pp 63-73

TEXT OF ENGLISH ABSTRACT: The electrochemical behavior of 2-thiazolidinethione (H_1), sodium phenyldithiopropylene sulfonate (S_1), and chloride-ion on copper electrodes was studied by voltammetry and a.c. impedance methods. The results show that all the above-mentioned additives are adsorbed on copper electrodes at a rather wide range of potential, and that the adsorption of H_1 is stronger than that of S_1 and the adsorption process is diffusion-controlled; furthermore, H_1 and chloride-ion may be coordinated with copper ions. In addition, the effect of these additives on the electrodeposition of copper is discussed.

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TITLE: "Model SY-1 Meter for the Determination of Dissolved Oxygen in Seawater"

SOURCE: Xiamen XIAMEN DAXUE XUEBAO [UNIVERSITATIS AMOIENSIS ACTA SCIENTIARUM NATURALIUM, NATURAL SCIENCE EDITION] in Chinese Vol 19 No 2, 1980 pp 74-80

TEXT OF ENGLISH ABSTRACT: The present paper describes a new model meter with an oxygen probe without a membrane for the determination of dissolved oxygen in seawater. It is designed after the principle of chronoamperometry. The precision of the apparatus is within ± 0.2 percent. The range of determination of dissolved oxygen is 0-8 ml-O_2/l and the error in determination is less than ± 1.0 percent. The working principle of the circuit and some of the data by this meter in various sea areas are also reported.

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TITLE: "A Study on the Phototactic Behavior of Sardine (*Sardinella perforata* Cantor) and Silverside (*Atherina bleekeri* Gunther)--Response to Diffused White Light and the Process of Adaptation to Iso-Illuminative Spectral Color"

SOURCE: Xiamen XIAMEN DAXUE XUEBAO [UNIVERSITATIS AMOIENSIS ACTA SCIENTIARUM NATURALIUM, NATURAL SCIENCE EDITION] in Chinese Vol 19 No 2, 1980 pp 81-88

TEXT OF ENGLISH ABSTRACT: Sardine (*Sardinella perforata* Cantor) shows the highest phototactic ratio toward white light in the region of 0.1~1 lux, but with the increase of light intensity its phototactic ratio decreases. The reaction of the silverside (*Atherina bleekeri* Gunther) under the same conditions increases with the raising of the light intensity, and reaches its maximum within the 10~100 lux region.

Under the condition of iso-illumination, the phototactic response of sardine and silverside to white and colored lights, with the duration of light

[Continuation of XIAMEN DAXUE XUEBAO Vol 19 No 2, 1980 pp 81-88]

stimulation, shows different process of adaptation under different conditions. The variation of process of adaptation is also associated with the character of light stimulation.

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ZHOU Zhongan [0719 2600 2706]
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ORG: JIANG of the Department of Oceanography; ZHOU of Zhangpu Fisheries Bureau; ZOU of the Fisheries Research Institute of Fujian

TITLE: "Preliminary Studies on the Populations of the Hair-tail (Trichiurus haumela (Forskal) of the Fishing Ground in the South Fujian and Taiwan Bank"

SOURCE: Xiamen XIAMEN DAXUE XUEBAO [UNIVERSITATIS AMOIENSIS ACTA SCIENTIARUM NATURALIUM, NATURAL SCIENCE EDITION] in Chinese Vol 19 No 2, 1980 pp 89-95

TEXT OF ENGLISH ABSTRACT: A comparison was made between the hair-tail populations from southern and northern regions of South Fujian and Taiwan Bank Fishing Ground, the differences estimated from the data of meristic characters, including the number of fin rays of the left pectoral fin and dorsal fin, the number of anal spines, the number of abdominal vertebrae, the number of left-upper and left-lower gill rakers, were shown by the method of discriminate function to be statistically significant. It was found that the eggs and larvae of hair-tails hauled during the same month in 1975-77 in these two regions were at the same stage of development. Based on this evidence, it was suggested that the hair-tail of these two regions should be divided into

[Continuation of XIAMEN DAXUE XUEBAO Vol 19 No 2, 1980 pp 89-95]

different ecological populations. They spawn in this fishing ground and should be considered as local populations of hair-tails. These groups of hair-tails are of great advantage to the administration of fisheries, and this should be taken into consideration when we estimate the fishery resources of this coastal region.

AUTHOR: LIN Yong[illegible] [2651 3262 [illegible]]
HE Yuefeng [0149 1768 2052]
YANG [illegible] [2799 2629 1557]
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ORG: All of the Parasitology Research Laboratory

TITLE: "Paragonimiasis in Yongan and Zhangpin Districts, Fujian"

SOURCE: Xiamen XIAMEN DAXUE XUEBAO [UNIVERSITATIS AMOIENSIS ACTA SCIENTIARUM NATURALIUM, NATURAL SCIENCE EDITION] in Chinese Vol 19 No 2, 1980 pp 96-106

EXCERPT FROM ENGLISH ABSTRACT: During 1978-1979 a general survey on the epidemiology and etiology of Paragonimiasis was undertaken in Zhangpin and Yongan Districts. There were 522 positives as shown by the intradermal tests made on 2,551 peasants and lumber workers with antigens prepared from adult *Paragonimus* westermani. The incidence varied from 12.23 percent to 25.76 percent. During our investigation inquiries were made on the food habits of the verified positives of intradermal tests. Of them, 56.32 percent and 35.10 percent from the two abovementioned districts answered to having eaten raw or partially cooked crabs.

Three species of freshwater snails, such as *Semisulcospira toucheana*, *Tricula*

[Continuation of XIAMEN DAXUE XUEBAO Vol 19 No 2, 1980 pp 96-106]

minutoides and *Tricula* sp., were found from the endemic area. *Semisulcospira toucheana* were found naturally infected with the cercariae of *Paragonimus westermani* in 0.031 percent to 0.41 percent of 12,802 snails examined, while the other two species, *Tricula minutoides* and *Tricula* sp., were free from infection. Infected with the metacercarial cysts of *P. westermani* were 134 of 190 crabs (70.5 percent) from Zhangpin and 117 of 251 crabs (46.6 percent) from Yongan. The number of cysts per crab varied from 1 to 1,118 (average 52.06) in Zhangpin, and 1 to 103 (average 8) in Yongan. The distribution of cysts in the bodies of crabs was studied. It was found that the majority of them were in the muscles of pincers and walking legs (45.57 percent) and also in the thorax (31.29 percent).

AUTHORS: WANG Zaisheng [3769 0175 3932]
XU Hanlun [1776 4988 0243]

ORG: Both of the Biology Department

TITLE: "Effect of Calonyctin A on the Differentiation of Callus Tissues from Rice Pollens"

SOURCE: Xiamen XIAMEN DAXUE XUEBAO [UNIVERSITATIS AMOIENSIS ACTA SCIENTIARUM NATURALIUM, NATURAL SCIENCE EDITION] in Chinese Vol 19 No 2, 1980 pp 105-109

TEXT OF ENGLISH ABSTRACT: Calonyctin A, a growth-regulating substance isolated from the leaves of Calonyction aculeatum, is an 11-O-pentaglycoside of ethyl jalapinolate. When it was added to the culture medium for growing rice callus tissues, it promoted the differentiation of green sprouts, making the green sprouts differentiate easily on those cultures that had hardly been able to undergo further differentiation due to too much root growth. The substance seemed to act by inhibiting the root growth and promoting the differentiation of green sprouts. The optimal concentrations were 1~3 mg/l.

These results showed that this new natural growth-regulating substance had an evident physiological regulatory activity on the growth and differentiation of callus tissues from rice pollens.

AUTHORS: LIU Shicheng [0491 1597 2052]
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TITLE: "Notes on Some New Species and New Records of Diatoms from the Strait of Taiwan (Fujian Coast), China. IV. Mastogloia, Nitzschia, Frustulia and Others"

SOURCE: Xiamen XIAMEN DAXUE XUEBAO [UNIVERSITATIS AMOIENSIS ACTA SCIENTIARUM NATURALIUM, NATURAL SCIENCE EDITION] in Chinese Vol 19 No 2, 1980 pp 110-117

EXCERPT FROM ENGLISH ABSTRACT: Eight new species and new varieties of diatoms of Mastogloia, Nitzschia, Frustulia and others were found in the Strait of Taiwan, China. Some of them are:

1. Mastogloia lanceostriata Liu et Chin, var. nov.
2. Mastogloia braunii var. constricta Liu et Chin, var. nov.
3. Mastogloia smithii var. excentrica Liu et Chin, var. nov.
4. Nitzschia didyma Liu et Chin, sp. nov.
5. Nitzschia majuscula var. lineata Liu et Chin, var. nov.

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CSO: 4009

AUTHOR: Li Yuzeng [5685 [illegible] 1529]
Li Zhiqing [5685 1807 3237]

ORG: Both of Shandong College of Oceanology

TITLE: "A Study on Prediction Methods by Using the Empirical Orthogonal Functions in Consideration of the Influence Factors"

SOURCE: Beijing HAIYANG YU HUZHAO [OCEANOLOGIA ET LIMNOLOGIA SINICA] in Chinese Vol 11 No 3, Jul 80 pp 189-203

TEXT OF ENGLISH ABSTRACT: The prediction equations formulated in the existing prediction methods by using the empirical orthogonal function are generally based upon field resolution according to the statistical relation among the predictands. The influence of external factors is seldom to be considered. The present paper attempts to introduce the influence factors into the empirical orthogonal prediction method. There are five different approaches to be proposed for this purpose, of which the field prediction method with optimum factors is studied with emphasis. In this method we consider not only the internal correlation among the predictands but also the influence of external factors, and the optimal prediction equation suitable for predicting both values and

[Continuation of HAIYANG YU HUZHAO Vol 11 No 3, Jul 80 pp 189-203]

fields can be formulated by the selected optimum factors from the combinational factors.

The concept of weighting correlation coefficient is suggested here. The obvious difference between it and other correlation coefficients is that the former has the field character. Several practical examples corresponding to the previously mentioned prediction methods are also presented in this paper.

AUTHOR: CAI Aizhi [5509 1947 2535]

ORG: Institute of Oceanology, Chinese Academy of Sciences

TITLE: "Development of the Accumulational Geomorphology of the Spit Diaolongzui"

SOURCE: Beijing HAIYANG YU HUZHAO [OCEANOLOGIA ET LIMNOLOGIA SINICA] in Chinese Vol 11 No 3, Jul 80 pp 204-210

TEXT OF ENGLISH ABSTRACT: Diaolongzui lies in the center of the eastern coast of Laizhou Bay. In the coastal plain there is an old coastline. There are many data revealing this old coastline: 1. the 5 m isometric line is a continuous, distinctive cliff, with a relative height of 1-2 meters; 2. Over the cliff is a slight slope consisting of a Q_3^{dpl} yellow stratum. On the Q_3^{dpl} slope, neither feature of marine erosion nor tract of marine accumulation is showing; 3. Below the old cliff is a Q_4^{m} mixture of sands, conches and muds.

Conditions under which the multi-accumulation spits were formed are as follows: A great bulk of the sands supplied from the Wanghe River, some supplied from the eastern coast of the Laizhou Bay, and the carrying by the wave and longshore current to the southwest.

[Continuation of HAIYANG YU HUZHAO Vol 11 No 3, Jul 80 pp 204-210]

Accumulational forms ① - ⑨ are developed in sequence. Behind each form there is a lagoon or marsh. After form ⑥ was developed, form ④ underwent a process of retreat from ④ to ⑤.

On the formation of a small barrier island, we favored Hoyt's hypothesis that the small barrier island may have been formed by spit growth across a lagoon and subsequent truncation of the spit during storms. For example: a. Form ⑧ was truncated by a storm into a small inlet and island 42 years ago; b. The smallest spit ⑦ was truncated into a smaller inlet and island in February, 1979, by a strong northern wind.

A contribution No 530 from the Institute of Oceanology, Chinese Academy of Sciences.

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ORG: Institute of Hydraulic Research, the Huanghe River Conservancy Commission

TITLE: "The Development of the Coastline of the Huanghe River Delta and Its Effects on the Upstream Channels"

SOURCE: Beijing HAIYANG YU HUZHAO [OCEANOLOGIA ET LIMNOLOGIA SINICA] in Chinese Vol 11 No 3, Jul 80 pp 211-219

TEXT OF ENGLISH ABSTRACT: As there are 1200 million tons of sediment transported into the sea annually, the deltaic development at the estuary of the Huanghe River (Yellow River) has its peculiarities, very different from those at other estuaries. Very large spits are formed at the river mouth. According to the growth conditions of the spits and the entire deltaic coastline, the deltaic development may be divided into cycles and subcycles, each cycle including several subcycles. In this paper the problems of how to divide the cycles of the modern Huanghe River delta and of the mode of the modern deltaic coastline development and its effects on the upstream channels are discussed.

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YUAN Hanxiang [5913 3352 4382]

ORG: ZHANG of the Department of Oceanological Chemistry, Shandong College of Oceanology; YUAN of the Research Institute of Seawater Utilization, Qingdao

TITLE: "An Infrared Spectrometric Study of the Reaction Mechanism of Uranium (VI) with the Hydrous Titanium Oxide in Seawater"

SOURCE: Beijing HAIYANG YU HUZHAO [OCEANOLOGIA ET LIMNOLOGIA SINICA] in Chinese Vol 11 No 3, Jul 80 pp 220-228

TEXT OF ENGLISH ABSTRACT: In the present article an infrared spectrometric study of the reaction mechanism of uranium (VI) with hydrous titanium oxide in seawater has been made, with results as follows:
1. The study of the reaction mechanism of uranium with hydrous titanium oxide in seawater was made under the following three different conditions:
(1) Under conditions of natural seawater; the relationship between the amount of uranium exchanged by hydrous titanium oxide and the duration of water flow has been studied, the results obtained being shown in Figure 1.
(2) Under conditions of set different concentrations of seawater; the results obtained are shown in Figures 2 to 5.
(3) The influence of magnetic field on the reaction of uranium with results as

shown in Figure 6.

2. The changes undergone by infrared spectrograms under the above three sets of conditions have been studied and a comparison of these spectrograms made, conducive to the exploration of the regularity of infrared spectrographic changes during the process of reaction between uranium (VI) with hydrous titanium oxide. The regularity of infrared spectrographic changes and the quantity of uranium exchanged by hydrous titanium oxide correspond with each other.

On the basis of experiments made in this article, explanations have been given for the absorption bands of infrared spectrograms.

3. A direct experimental basis is offered to the study of the reaction mechanism of uranium (VI) with hydrous titanium oxide by the regularity of changes of infrared spectrograms. The results are in agreement with those obtained by using the pH method, viz. (1) Under conditions of concentrated seawater, UO_2^{2+} and the H^+ of OH base on the surface of hydrous titanium oxide undergo cation ion exchange; (2) Under conditions of natural seawater (including conditions with and without the effect of magnetic field respectively); the study by means of "complexation-dewater" reaction or by cation ion exchange reaction mechanism may be possible.

AUTHOR: LI Minghou [4764 2494 0186]
FU Shuzhu [5543 3219 3796]
LI Xiangli [4764 4382 4409]

ORG: All of the Institute of Oceanology, Chinese Academy of Sciences

TITLE: "Studies on the Initial Products of ^{14}C Metabolism in *Laminaria japonica*"*

SOURCE: Beijing HAIYANG YU HUZHAO [OCEANOLOGIA ET LIMNOLOGIA SINICA] in Chinese Vol 11 No 3, Jul 80 pp 229-240

TEXT OF ENGLISH ABSTRACT: We carried out photosynthetic experiments from 1 hr to 12 hrs with cultivated *Laminaria japonica* frond in $^{14}CO_2$ gas, in $NaH^{14}CO_3$-containing seawater, and in $^{14}CO_2$-containing seawater, and studied the distribution of alcohol soluble compounds in EtOH extractives and of sugars in the acid hydrolyzates using paper chromatographic and autoradiographic methods.

The radioactivities in alcohol soluble fractions in the case of both $^{14}CO_2$ gas and $NaH^{14}CO_3$-containing seawater in general increased with the time of illumination. As shown in 1963's experiments, the radioactivities in two cases after 12 hours of illumination were seven and five times greater than those after 1 hr of illumination respectively. The radioactivities in *Laminaria* residue after

[Continuation of HAIYANG YU HUZHAO Vol 11 No 3, Jul 80 pp 229-240]

alcoholic extraction also increased with the time of illumination. The paper chromatograms of alcohol soluble fractions in the case of $^{14}CO_2$ gas showed the presence of free amino acids, such as Asp, Ala, Glu, Pro, Val and mannitol, in the 1963's experiments, and with the addition of Tyr, Leu and Ile in 1964's experiments. The order of radioactivity in chromatograms generally was: mannitol > Asp > Ala > Glu. In addition to these, radioactive Val, Ile and some unknown compounds also appeared. The radioactivity of mannitol was 92-94 percent and 79-87 percent of the total found in EtOH extracts in 1963 and 1964 respectively. Apart from a small amount of radioactive mannitol, almost no radioactivity was found in other chromatograms in the case of 6 hr illumination in NaH$^{14}CO_3$-containing seawater, and even after 12 hrs illumination it still showed only little radioactivity in mannitol, Asp and Ala.

The paper chromatograms of sugars in hydrolyzate of *Laminaria* residue showed that no ^{14}C was incorporated into them, and a considerable amount of radioactivity still remained near the original spot in 1963's experiments. But from 1964's experiments it was apparent that some ^{14}C was incorporated into mannuronolactone and other uronic acids according to the pattern of paper chromatograms of Linkers et al. The acid hydrolyzate of hot water extractive from *Laminaria* also gave radioactivities in the chromatograms corresponding to fucose and

[Continuation of HAIYANG YU HUZHAO Vol 11 No 3, Jul 80 pp 229-240]

xylose in 1964's experiments.

* Contribution No 560 from the Institute of Oceanology, Chinese Academy of Sciences.

AUTHORS: ZHAO Changchun [6392 7022 2504]
CAI [illegible] [illegible]
SHI Zhongxiang [2457 [illegible]]
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YANG Weijin [2799 [illegible]]

ORG: ZHAO, CAI, SHI and WANG, all of Shanghai Fisheries College; YANG of Fujian Fisheries Institute

TITLE: "The Possibility of Recovering the Reproductive Capacity in Spawned Eels"

SOURCE: Beijing HAIYANG YU HUZHAO [OCEANOLOGIA ET LIMNOLOGIA SINICA] in Chinese Vol 11 No 3, Jul 80 pp 251-256

TEXT OF ENGLISH ABSTRACT: The gravid eels, after spawning by artificial inducement, were reared in freshwater and seawater of a salinity of 25-30 percent respectively. It was found that in both cases the spawned eels gradually recovered their appetites and were kept alive for a long time. After two years the corporal condition was recovered to a state of commencing the descending migration to the sea. Histological examination of the various regions of the alimentary canal was made and showed it to be quite normal. The ovary was investigated histologically and a large number of oocytes in phases II and III were developed. All these facts lead us to infer that in the natural condition, spawned eels would stay alive and retain their reproductive capacity.

AUTHORS: CHEN Mu [7115 [illegible]]
WU Baoling [0702 1405 0535]

ORG: CHEN of Fujian Institute of Fishery Sciences; WU of the Institute of Oceanology, Chinese Academy of Sciences

TITLE: "Two New Species of the Genus Hydroides (Polychaeta, Serpulidae)*"

SOURCE: Beijing HAIYANG YU HUZHAO [OCEANOLOGIA ET LIMNOLOGIA SINICA] in Chinese Vol 11 No 3, Jul 80 pp 247-250

TEXT OF ENGLISH ABSTRACT: While working on the Serpulidae, two new species of Hydroides were found in the shallow depths of the South China Sea. The descriptions of the two new species are given in this article.

* Contribution No. [illegible] from the Institute of Oceanology, Chinese Academy of Sciences.

AUTHORS: ZHANG [illegible] [illegible]
[illegible] [illegible]

ORG: ZHANG of the Department of Biology, South China Teachers' College, Guangzhou; [illegible] of the Department of Fisheries, Central China Agricultural College, Wuhan

TITLE: "Monogenetic Trematodes of Freshwater Fishes: Two Additional *Dactylogyrus* from Anabantidae"

SOURCE: Beijing HAIYANG YU HUZHAO [OCEANOLOGIA ET LIMNOLOGIA SINICA] in Chinese Vol 17 No [illegible], [illegible] 86 pp [illegible]

EXCERPT FROM ENGLISH ABSTRACT: Two additional species of *Dactylogyrus*, *D.* *[illegible]* sp. nov. and *D.* *[illegible]* sp. nov., are reported respectively for *[illegible]* *chinensis* and *[illegible]* *lineatus* from Wuhan and Guangzhou, China.

AUTHOR: QIU [illegible] [illegible]

ORG: Department of Oceanography, University of Xiamen

TITLE: "On the Nematocyst-bearing Ctenophore *Euchlora rubra* Kolliker from Xiamen Harbor"

SOURCE: Beijing HAIYANG YU HUZHAO [OCEANOLOGIA ET LIMNOLOGIA SINICA] in Chinese Vol 17 No 1, Jan 86 pp [illegible]

TEXT OF ENGLISH ABSTRACT: On 6 August 1961, a rare nematocyst-bearing ctenophore *Euchlora rubra* Kolliker was collected from Xiamen Harbor by the author. Later, from October 1963 to September 1965, more specimens were obtained. The present paper gives a description of the morphology and living habits of the animal; its phylogenetic relationship with other ctenophores is also discussed.

AUTHOR: WANG Zhenrui [illegible]

ORG: Institute of Oceanology, Chinese Academy of Sciences

TITLE: "Studies on Chinese Species of the Family Pectinidae ([illegible]) I. A New Species of the Subfamily Propeamussiinae"*

SOURCE: Qingdao HAIYANG YU HUZHAO [OCEANOLOGIA ET LIMNOLOGIA SINICA] in Chinese Vol 11 No 3, Jul 80 pp 259-262

TEXT OF ENGLISH ABSTRACT: The present study is based mainly on the collections of Propeamussiinae from the East and South China Sea by the Institute of Oceanology, Chinese Academy of Sciences, during 1959-1978. There are two species. One is [illegible] jeffreysi (Smith), which is first recorded from our coast and tends to occur in deeper waters. The other, Ctenamussium [illegible], is a new species.

* Contribution No [illegible] from the Institute of Oceanology, Chinese Academy of Sciences.

AUTHOR: LIN Guangyu [2651 0342 1342]

ORG: Institute of Oceanology, Chinese Academy of Sciences

TITLE: "A New Genus and Species of Ringiculidae"*

SOURCE: Qingdao HAIYANG YU HUZHAO [OCEANOLOGIA ET LIMNOLOGIA SINICA] in Chinese Vol 11 No 3, Jul 80 pp 263-266

TEXT OF ENGLISH ABSTRACT: In October, 1951, the Institute of Oceanology, Chinese Academy of Sciences, carried out an investigation on the molluscan fauna of the intertidal zone of Tanggu, Hebei Province, China. Of the specimens collected, a small-shelled Opisthobranchia was found to be a new species representing a new genus of the family Ringiculidae Meek, 1863.

* Contribution No [illegible] from the Institute of Oceanology, Chinese Academy of Sciences.

AUTHORS: ZHANG Junfu [1728 1498 4395]
XIA Bangmei [1115 6721 5019]

ORG: Both of the Institute of Oceanology, Chinese Academy of Sciences

TITLE: "Two New Species of *Laurencia* from the Xisha Islands, Guangdong Province, China"

SOURCE: Beijing HAIYANG YU HUZHAO [OCEANOLOGIA ET LIMNOLOGIA SINICA] in Chinese Vol 11 No 3, Jul 80 pp 267-274

EXCERPTS FROM ENGLISH ABSTRACT: In the studies of the species of marine red algae from the Xisha Islands, Guangdong Province, China, two interesting red algae are included. After morphological observations, we came to the conclusion that these algae are two new species of *Laurencia*. The type specimens of the new species are deposited in the Herbarium of the Institute of Oceanology, Chinese Academy of Sciences.

Contribution No 566 from the Institute of Oceanology, Chinese Academy of Sciences.

AUTHOR: CHEN Hongda [7115 3163 6671]

ORG: Institute of Hydrobiology, Chinese Academy of Sciences

TITLE: "Structure and Dynamics of Macrophyte Communities in Lake Donghu, Wuhan"

SOURCE: Beijing HAIYANG YU HUZHAO [OCEANOLOGIA ET LIMNOLOGIA SINICA] in Chinese Vol 11 No 3, Jul 80 pp 275-284

TEXT OF ENGLISH ABSTRACT: Lake Donghu, a shallow lake covering an area of 28.7 km^2, is situated in Wuhan City, Hubei Province. Investigations of the structure of macrophyte communities in the lake were carried out during 1962-1963, while the observations on the community dynamics were undertaken in the period of 1975-1978.

By use of sample plot method, adopted in the study of terrestrial plant communities, the basic characteristics of macrophyte communities in the lake were described and analyzed. These characteristics have been: the dominant species composition, community classification, distribution of associations, zonation, stratification, frequency, biomass, coverage and periodicity, etc.

The greatest change of community structure in some parts of the lake was the [[illegible] HAIYANG YU HUZHAO Vol 11 No 1, [illegible] pp [illegible]]

the decline of *Potamogeton maackianus*. In the 60's *Potamogeton maackianus* constituted among the dominant species in the lake, but it was completely destroyed in the 70's mainly because of over-stocking of grass carp. Since 19[illegible], when most of the stocked grass carp had been harvested, *Najas major*, *Myriophyllum spicatum* and *Vallisneria spiralis* made a full recovery, but *Potamogeton maackianus* has not yet reappeared.

Based upon the viewpoint of [illegible], this paper emphasizes the importance of the protection of the aquatic macrophyte communities.

AUTHOR: CHEN Zhuomao [7115 [illegible]]
ZHOU [illegible] [0719 [illegible]]

ORG: Both of the Department of Biology, Fujian Normal University

TITLE: "A New Species of *Mougeotia* from Fujian Province"

SOURCE: Qingdao HAIYANG YU HUZHAO [OCEANOLOGIA ET LIMNOLOGIA SINICA] in Chinese Vol 11 No 3, Jul 80 pp 285-288

TEXT OF ENGLISH ABSTRACT: *Mougeotia fujianensis* Chen & Zhou, sp. nov.

The new species of *Mougeotia* was collected from [illegible] Mountain, Fujian Province. It is characterized by having purple cell-sap, with the diameter of its vegetative cells varying from 10-14µm, and the length varying from 72-276µm, each with a single, axile, plate-like chromatophore, having 1-12 pyrenoids, [illegible]. Conjugation is mainly scalariform (rarely lateral), zygospore compressed quadrangular, with distinct [illegible] "rib-like" [illegible] the walls.

9717
CSO: 4008

AUTHOR: [illegible] [illegible]
[illegible] [illegible]
[illegible] [illegible]
[illegible] [illegible]

ORG: None

TITLE: "On Effect of the Anti-Vibration Cave on Reducing Ship's Vibration"

SOURCE: Shanghai SHANGHAI JIAOTONG DAXUE XUEBAO [JOURNAL OF SHANGHAI JIAOTONG UNIVERSITY] in Chinese No [illegible], May 90 pp 1-[illegible]

TEXT OF ENGLISH ABSTRACT: The stern vibration excited by the propeller is a [illegible] question for the ship designers and owners. Based on the active vibration isolation principle, the structural model tests have been carried out and the possibility of reducing stern vibration by use of the anti-vibration cave for the practical ships is demonstrated. The results of ship model towing tests indicate that the influence of anti-vibration cave on ship resistance is slight. The actual ship experimental results also show that this measurement is effective and satisfactory.

AUTHOR: [illegible] [illegible]
[illegible] [illegible]

ORG: None

TITLE: "An Investigation on the Determination of Optimal Structural Dimensions of a Simple Supported Box Girder and a Propeller-Shaft Key"

SOURCE: Shanghai SHANGHAI JIAOTONG DAXUE XUEBAO [JOURNAL OF SHANGHAI JIAOTONG UNIVERSITY] in Chinese No [illegible], May 90 pp 15-22

TEXT OF ENGLISH ABSTRACT: The SCGD method and its computer program are given in references [1] and [2]. This paper deals with the two-dimensional optimum structural design of a simple supported box girder by SCGD method and [illegible] [illegible], the determination of optimal dimensions of a propeller-shaft key by SCGD method. The results are discussed.

AUTHOR: [illegible] [illegible]

ORG: None

TITLE: "Mathematical Design of Ship Surface and Design [illegible] [illegible]"

SOURCE: SHANGHAI JIAOTONG DAXUE XUEBAO [JOURNAL OF SHANGHAI JIAOTONG UNIVERSITY] in Chinese No 1, Mar 86 pp 21-36

TEXT OF ENGLISH ABSTRACT: The fairness of ship surface is important in designing and building a ship hull. This article describes the method with typical [illegible] which gives some conditions for its fairness. This method enables the designers to get a ship surface with fairness in three directions, and is possibly a good condition for ship building. The ship designer can flexibly select ship body parameters and change ship form.

KEY WORDS: ship surface, [illegible] curve, buttock line and diagonal line, [illegible] fairness.

AUTHOR: [illegible] [illegible]

ORG: None

TITLE: "Determination of Vibration Amplitudes and Vibration Stresses of [illegible] by Use of Laser Holography Techniques and Finite Element Method"

SOURCE: SHANGHAI JIAOTONG DAXUE XUEBAO [JOURNAL OF SHANGHAI JIAOTONG UNIVERSITY] in Chinese No 1, Mar 86 pp 19-32

TEXT OF ENGLISH ABSTRACT: A new method of determination of the distribution of vibration amplitudes and vibration stresses of the turbine rotating blade is presented in this paper. This method makes use of the holographic interferometry combined with the finite element method. The three-dimensional field of displacement is calculated according to the number of interference fringes of certain points of the blade and the field of the vibration stresses is obtained by the field of vibration displacement. In comparison with the [illegible] conditions of the [illegible] of measurement, the present method is convenient, particularly for the higher vibration modes.

AUTHOR: WANG [illegible] [illegible]

ORG: [illegible]

TITLE: "The Application of Generalized Eigenvalue and Eigenvector in the Calculation of Transient Oscillations in Power Transformer Windings"

SOURCE: Shanghai SHANGHAI JIAOTONG DAXUE XUEBAO [JOURNAL OF SHANGHAI JIAOTONG UNIVERSITY] in Chinese No 2, May 80 pp 71-72

TEXT OF ENGLISH ABSTRACT: This paper presents a method of calculating transient oscillations in power transformer windings during the impulse test. The differential equations for the equivalent network are formulated using the [illegible] method in network analysis. With the application of the [illegible] transformation and of the matrix partitioning, the differential equations can be expressed in simple form, i.e., $C\ddot{q} + \Gamma q = g(t)$. The interpretation of the coefficient matrices is straightforward. Based on the fact that the coefficient matrices are positive definite matrices, the differential equations are resolved by finding the generalized eigenvalues and eigenvectors of these matrices, thus [illegible] the speed of calculation. The corresponding amplitudes and frequencies of the harmonic components are given. A comparison is made between the calculated values and the measured ones.

AUTHOR: [illegible] [illegible]

ORG: None

TITLE: "Signal Detection and Image Processing"

SOURCE: Shanghai SHANGHAI JIAOTONG DAXUE XUEBAO [JOURNAL OF SHANGHAI JIAOTONG UNIVERSITY] in Chinese No 2, May 80 pp 73-80

TEXT OF ENGLISH ABSTRACT: The detecting of underwater acoustic waves in [illegible] holographic [illegible] is being attractive as the image can be processed by [illegible] computer or optical equipment so as to increase the sensitivity [illegible]. The underwater acoustic signals can be converted directly into [illegible] images. As each pixel of the image is a two-dimensional function, it [illegible] information than is obtained by using a general piezoelectric transducer which usually gives information of one-dimensional function only. [illegible] is advantageous to the increase of the signal-to-noise ratio.

In experiments described in this paper, a spatial filter is used for processing [illegible] of the signal waves and the enhancement of the image is [illegible]. The processed image is photographed as shown.

AUTHOR: [illegible]

ORG: None

TITLE: "A Discussion on the Resolution of the Panoramic Receiver"

SOURCE: Shanghai SHANGHAI JIAOTONG DAXUE XUEBAO [JOURNAL OF SHANGHAI JIAOTONG UNIVERSITY] in Chinese No 2, May 80 pp 81-96

TEXT OF ENGLISH ABSTRACT: Resolution is an important criterion of a panoramic receiver. In this paper, the definition of the resolution, the static and dynamic resolution, and the computation method of resolution under some conditions are discussed. A general formula has been derived. This formula indicates that the resolution of the panoramic receiver is proportional to its bandwidth, and the factor of proportionality ζ depends upon the type of the IF filter and the detector. The values of ζ are given for different conditions.

All the results in this paper are also compatible with the spectrum analyzer.

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JIANG [illegible] [1203 1962 0022]
FANG [illegible] [illegible]
ZHU Zhongqing [2612 2973 3887]

ORG: None

TITLE: "Study and Application of Semiautomatic Underwater Arc Cutting by the Usage of [illegible] Electrode Water Jet Technique"

SOURCE: Shanghai SHANGHAI JIAOTONG DAXUE XUEBAO [JOURNAL OF SHANGHAI JIAOTONG UNIVERSITY] in Chinese No 2, May 80 pp 97-110

TEXT OF ENGLISH ABSTRACT: Based on the instantaneous phenomenon of a moving arc column during underwater cutting and oscillograms of arc current and voltage, this paper analyzes the characteristics of the burning of arcs in [illegible] electrode water jet semiautomatic underwater cutting, studies its mechanism and advances the hypothesis that there may exist a high temperature "[illegible] cavity" during continuous steady cutting.

The paper also deals with the requirements to the power supplies for cutting and proposes some important problems in developing cutting apparatus. The relationship between different standard parameters has been obtained.

[Continuation of SHANGHAI JIAOTONG DAXUE XUEBAO No 2, May 80 pp 97-110]

[illegible] experimental experiments carried out in continuous [illegible] cutting conditions.

The performance, characteristics and principal technical parameters of [illegible] consumable electrode [illegible] semi-automatic underwater cutting apparatus are [illegible].

The last part of the paper is a brief account of a successful cutting on the construction site at a depth of 60 meters under water, using a consumable electrode water jet technique with a cutting speed of up to 20 m/h and greater.

AUTHOR: [illegible] [illegible]

ORG: None

TITLE: "A Brief Remarks of Auxiliary Projection of Two Skew Lines"

SOURCE: Shanghai SHANGHAI JIAOTONG DAXUE XUEBAO [JOURNAL OF SHANGHAI JIAOTONG UNIVERSITY] in Chinese No 2, May 80 pp 111-130

TEXT OF ENGLISH ABSTRACT: This article first comments on the solution for the problem I, to find the auxiliary projection in which the projected images of two skew lines would be equal in length and parallel, worked out by five professors, and then presents a regular method of solution. The professors' solution was published in the American magazine, ENGINEERING DESIGN GRAPHICS JOURNAL. After the analysis and inductive reasoning in the pictorial drawing with the construction of three oblique rectangular prisms, the space structure of [illegible] solutions has been generalized.

It is had once thought of an Australian professor by the name of Abe Rosenberg that changed "of equal length and parallel" in problem I to "of equal length and not parallel" in problem II. Now, the author is going to present two fundamental solutions of universal significance. First, he is to work out problem (I) to find the auxiliary projection in which the projected images of two view lines would be equal in length; from theorem (1) is derived a "projecting cone" which may be applied to problems I and II. Secondly, he is to work out theorem (2), to make the projection of an irregular tetrahedron symmetrical; theorem (2) shows that the projector with symmetrical form is the solitary intersecting line of three projecting cones with common vertex.

Lastly the author supplements something in this article after reading the solutions of problem II worked out by the four professors and published in the same American magazine. The author points out that professor Robert F. Kelso's solution can only give the answer to the symmetrical form, being a special case of the second fundamental solution discussed in this article. There exist the limitations of proposition in the solution of the other three professors. In the five figures of the last paragraph of this article, the projecting cone is used to show the existence of such limitations and to determine their scope.

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ORG: None

TITLE: "The Real Situation of the Birth of the Law of Inertia"

SOURCE: Shanghai SHANGHAI JIAOTONG DAXUE XUEBAO [JOURNAL OF SHANGHAI JIAOTONG UNIVERSITY] in Chinese No 2, May 80 pp 131-138

TEXT OF ENGLISH ABSTRACT: This paper clarifies the real situation of the birth of the law of inertia, the basis of mechanics which initiated the modern experimental science. In recent years some works of history of science have discussed this topic with wrong expositions. To counter these expositions, the author proposes different opinions and elucidates his own view in this paper.

AUTHOR: CAO Zongying [illegible]

ORG: None

TITLE: "Probability Interpretation and Determinism Are Inconsistent in Quantum Mechanics"

SOURCE: Shanghai SHANGHAI JIAOTONG DAXUE XUEBAO [JOURNAL OF SHANGHAI JIAOTONG UNIVERSITY] in Chinese No 2, May 80 pp 139-142

TEXT OF ENGLISH ABSTRACT: On the foundation of quantum mechanics, P. A. M. Dirac has made the speculation several times recently that it is impossible to reintroduce determinism in quantum mechanics if we do not give up some strongly upheld fundamental conceptions. Dirac's speculation will be worked out in this paper. It rigorously proves that if we do not give up the concept of wave-particle duality, in other words, if we do not give up the state superposition principle and the probability interpretation, consequently not giving up the uncertainty relation, it is impossible to reintroduce determinism in quantum mechanics.

9717
CSO: 4009

AUTHOR: ZHANG Youwen [1728 1635 2429]

ORG: Shanghai Jiaotong University

TITLE: "Modification of the Sensibility Equations of Various Infrared Systems"

SOURCE: Beijing WULI XUEBAO [ACTA PHYSICA SINICA] in Chinese Vol 29 No 7, Jul 80 pp 813-828

TEXT OF ENGLISH ABSTRACT: When the target is a gray body, especially when its temperature is nearly equal to that of circumferential bodies, the target's self-radiation and the circumferential radiation reflected by the target must be considered. Thus, the sensibility equations of various infrared systems have to be modified. According to these modified equations, we can explain some experimental phenomena that cannot be interpreted by the unmodified equations in which only self-radiation is taken into account.

Here we discuss the thermal imaging systems in detail and the effects of the following factors on them. These factors are: the temperature differential, emissivity differential and reflectivity differential of adjacent detecting

[Continuation of WULI XUEBAO Vol 29 No 7, Jul 80 pp 813-828]

elements in the scene and the scanning efficiency, scanning superposition ratio and series-parallel arrangement of detector arrays, additional field lens or immersion lens, and so on. Then, we obtain the more complete sensibility equations and the formula of the noise equivalent temperature differential (NETD) for thermal imaging systems. The calculation methods of X_T in NETD are described and the numerical tables of X_T are given.

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ORG: ZHANG Youwen of Shanghai Jiaotong University; ZHANG Caigen of the Shanghai Institute of Applied Physics, Chinese Academy of Sciences

TITLE: "Measurement of the Emissivity and Radiation Temperature of Various Room Temperature Materials"

SOURCE: Beijing WULI XUEBAO [ACTA PHYSICA SINICA] in Chinese Vol 29 No 7, Jul 80 pp 829-835

TEXT OF ENGLISH ABSTRACT: The emissivity of various room temperature materials may be measured simply by the HD Infrared Low Temperature Radiometer, the results of which are in agreement with those of other articles.

When the radiation temperature of various room temperature materials is measured, it is found that the values obtained are nearly all the same. In order to explain these experimental results, the corresponding formulas are deduced and, in these cases, the reflective radiation must be considered.

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ORG: PAN and LUO both of the Institute of Physics, Chinese Academy of Sciences; LIU of the Department of Physics, Beijing University

TITLE: "A Model of the Relative Displacement of the d Band in A-15 Superconducting Compounds"

SOURCE: Beijing WULI XUEBAO [ACTA PHYSICA SINICA] in Chinese Vol 29 No 7, Jul 80 pp 836-842

TEXT OF ENGLISH ABSTRACT: The characteristics of the crystal field in A_3B-type compounds with A-15 structure are considered, the relative displacements ΔE_d between d-electron energy levels for atom A are calculated according to the pair potential model, and an improved RCA energy band model is further suggested based on the LCAO method. By following this approach, the dependence on Δ_d of the superconducting critical temperature of the V_3B compounds is obtained. The theoretical results are in rough agreement with experimental data.

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ORG: All of the University of Science and Technology of China

TITLE: "An Approximate T_c Formula of Type A Superconductors (II) In the Case of $\mu^* \neq 0$"

SOURCE: Beijing WULI XUEBAO [ACTA PHYSICA SINICA] in Chinese Vol 29 No 7, Jul 80 pp 843-849

TEXT OF ENGLISH ABSTRACT: In the present paper, the analyses for the numerical solution of the Eliashberg equation and the T_c formula of Type A superconductor, which were presented in the previous paper of this series, are extended to the case of $\mu^* \neq 0$.

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TITLE: "Low Frequency Internal Friction in Aluminum-Copper Alloys in the Process of Plastic Deformation"

SOURCE: Beijing WULI XUEBAO [ACTA PHYSICA SINICA] in Chinese Vol 29 No 7, Jul 80 pp 850-859

TEXT OF ENGLISH ABSTRACT: Low frequency internal friction in the process of plastic deformation of Al-Cu and Al-Mg alloys was measured on a small tensile test machine and a series of internal friction jumps was observed on the internal friction-strain curve. A study was made on the effect of temperature of measurement and some metallurgical factors on these internal friction jumps. Experimental results showed that the range of the temperature of measurement within which these internal friction jumps appeared corresponds to that for the appearance of the serrated stress-strain curves of aluminum-copper alloys. This indicates that these internal friction jumps on the internal friction-strain curves are associated with the process of strain aging occurring in the

[Continuation of WULI XUEBAO Vol 29 No 7, Jul 80 pp 850-859]

process of plastic deformation, i.e., they are originated from the alternate anchoring of dislocations by atmospheres of solute atoms and their subsequent escaping in the course of plastic deformation.

AUTHOR: BA Tu [1572 0956]
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TITLE: "Morphology of the Copper Precipitates in Silicon Single Crystals"

SOURCE: Beijing WULI XUEBAO [ACTA PHYSICA SINICA] in Chinese Vol 29 No 7, Jul 80 pp 860-866

TEXT OF ENGLISH ABSTRACT: In this article, infrared microscopy and etching method were used to study the morphology of the copper precipitates in silicon crystals. It was found that a variety of copper precipitates observed by infrared microscopy consists of precipitated disks laying in {110} planes and their morphology bears no relation to the properties of the sample.

AUTHOR: XU Zhenjia [6079 2182 0857]
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TITLE: "Infrared Absorption of Oxygen in Silicon and Germanium at Low Temperatures"

SOURCE: Beijing WULI XUEBAO [ACTA PHYSICA SINICA] in Chinese Vol 29 No 7, Jul 80 pp 867-877

TEXT OF ENGLISH ABSTRACT: Infrared absorption measurements of oxygen in silicon and germanium were made with IR Fourier Transform Spectrometer at temperatures between 6 K and 300 K in the region of 400-4000 cm^{-1}. Resolution was up to 0.5 cm^{-1} when high resolution conditions were adopted.

[Continuation of WULI XUEBAO Vol 29 No 7, Jul 80 pp 867-877]

Detection limit and sources of error on oxygen concentration of silicon and germanium determined by infrared absorption measurement at low temperature were identified. Using a 2 cm thick sample, the lower limit of detectability for oxygen at 20 K is estimated to be 9.6×10^{14} oxygen atom. cm^{-3} and 1.0×10^{14} oxygen atom. cm^{-3} in silicon and germanium respectively. The oxygen concentration of CZ germanium single crystals with different growth conditions was also studied and these results determined by IR measurements have been investigated and discussed by copper-lithium precipitation technique.

Temperature-dependent fine structure of 1106 cm^{-1} absorption band of silicon with different oxygen concentration has been investigated and discussed at temperatures between 6 K and 300 K.

AUTHOR: ZHOU Guangzhao [0719 0342 0664]
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ORG: All of the Institute of Theoretical Physics, Chinese Academy of Sciences

TITLE: "Transformation Properties of Three Sets of Closed Time Path Green's Functions"

SOURCE: Beijing WULI XUEBAO [ACTA PHYSICA SINICA] in Chinese Vol 29 No 7, Jul 80 pp 878-888

TEXT OF ENGLISH ABSTRACT: In this article, we derived the transformations among three sets of closed time path Green's functions and some calculation rules, from which a general definition of arbitrary multipoint retarded and advanced Green's functions follows naturally. Some algebraic identities among multipoint functions have shown to be the consequences of the property $W[J_+,J_-]\big|_{J_+=J_-=J} = 0$ for the generating functional on the closed time path.

AUTHOR: DU Youwei [6757 2589 3634]
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TITLE: "A Study on Growth Condition of FeOOH (II)"

SOURCE: Beijing WULI XUEBAO [ACTA PHYSICA SINICA] in Chinese Vol 29 No 7, Jul 80 pp 889-896

TEXT OF ENGLISH ABSTRACT: The paper describes the condition of forming α-FeOOH in the alkaline solution and the various factors that influence the phase composition.

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WANG Zhiying [3769 1807 5391]

ORG: All of the Shanghai Institute of Optics and Fine Mechanics, Chinese Academy of Sciences

TITLE: "The Theory of Resonantly Enhanced Four-Wave Mixing in Absorbing Media"

SOURCE: Beijing WULI XUEBAO [ACTA PHYSICA SINICA] in Chinese Vol 29 No 7, Jul 80 pp 897-904

TEXT OF ENGLISH ABSTRACT: In this work, the exact result of the problem of four-wave mixing in resonant absorbing media has been obtained. The effects of the degenerate four-wave mixing in the Nd^{3+}: glass were calculated, the theoretical results agreeing well with the experimental measurement.

AUTHOR: GAO Zhi [7559 2535]
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ORG: Both of the Institute of Mechanics, Chinese Academy of Sciences

TITLE: "Analytical Theory of Steady CO Laser"

SOURCE: Beijing WULI XUEBAO [ACTA PHYSICA SINICA] in Chinese Vol 29 No 7, Jul 80 pp 905-915

TEXT OF ENGLISH ABSTRACT: In order to predict the characteristics of the CO laser, usually nearly a hundred stiff differential equations must be solved numerically. Thus it is of interest to make an analytical approach to this subject. Starting from the basic governing equations for vibrational-distribution function and radiative intensities, we have deduced the gain-saturation relation of a steady CO laser. We consider the general case in which both homogeneous and inhomogeneous broadening exist simultaneously for the radiative transition. The effects of multilevel cascade emission is elucidated. For two special cases of two-level emission and homogeneous broadening limit, the present results are in agreement with the theories presented by Lacina and Napartovits, respectively.

AUTHORS: ZHOU Yuwei [0719 3768 5019]
CAI Shidong [5591 6108 2639]

ORG: Both of the Institute of Physics, Chinese Academy of Sciences

TITLE: "Parametric Instabilities with Well Separated Frequencies in Magnetized Plasma"

SOURCE: Beijing WULI XUEBAO [ACTA PHYSICA SINICA] in Chinese Vol 29 No 7, Jul 80 pp 916-926

TEXT OF ENGLISH ABSTRACT: A nonlinear dispersion relation is derived for the homogeneous, magnetized plasmas by the conventional "ponderomotive force" method. By using this unified dispersion relation, various parametric instabilities (stimulated anomalous absorptions and scatterings) are discussed. The results are compared with those obtained by other authors in detail. In the validity region of this model ($\omega_{idler} \ll \omega_{pump}$), the results derived by previous authors can be recovered. In addition to obtaining a few instabilities which have not appeared in the literature, we also find that in general:
1. the "dipole approximation" can give the right results for the stimulated anomalous absorption problems, and
2. the magnetic field may enhance the plasma stability.

AUTHOR: YOU Junhan [1429 1498 3352]
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ORG: Both of the University of Science and Technology of China

TITLE: "The Cerenkov Line Radiation and the Emission-Line Spectra of QSOs"

SOURCE: Beijing WULI XUEBAO [ACTA PHYSICA SINICA] in Chinese Vol 29 No 7, Jul 80 pp 927-936

TEXT OF ENGLISH ABSTRACT: The Cerenkov effect in gas medium is discussed. It is pointed out that the relativistic electrons with isotropic distribution of velocity, when moving through a dense gas, will produce the broad atomic emission-lines with a remarkably asymmetric profile, the continuum slope on its long wave side being quite flat and that on the short wave side very steep.

Calculation for the hydrogen atom shows that the width of L_α line may be larger than 60 Å as the gas density reaches $N = 5 \times 10^{20}$ cm^{-3}. According to this radiation mechanism, the emission-line spectra of QSOs can be interpreted satisfactorily.

9717
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ORG: QIAN, LI, YANG Pingyu and YANG Xugang all of the Shanghai Textile Engineering College; YANG Genxian and DING both of the Acrylic Plant, Shanghai General Petrochemical Plant

TITLE: "Crimping of Acrylic Fibers"

SOURCE: Shanghai FANGZHI GONGXUEYUAN XUEBAO [JOURNAL OF SHANGHAI COLLEGE OF TEXTILE TECHNOLOGY] in Chinese Vol 6 No 1, Mar 80 pp 1-11

TEXT OF ENGLISH ABSTRACT: A method of characterizing crimp and crimp stability by means of a tensile tester sensitive to a fraction of a milligram was described. Conditions of crimping in a stuffing box were studied, especially with reference to the glass transition temperature of acrylic fibers in water.

[Continuation of FANGZHI GONGXUEYUAN XUEBAO Vol 6 No 1, Mar 80 pp 1-11]

It was discovered that heated-wet acrylic fibers are liable to mechanical damage by squeezing in a stuffing box, causing fibrillation as shown by a number of scanning electron micrographs. It was also found that the crimping properties of the fiber are also strongly influenced by the mechanical handling from the crimping machine, through heat setting, to the drier. Finally, the relation between crimping and processing properties on a carding machine was also studied.

AUTHOR: YAO Ruiyue [1202 3843 3293]
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ORG: YAO and JIANG both of the Shanghai Textile Engineering College; LIU of the Shanghai Woolen Mill No 12

TITLE: "The Effect of Phasing on Twist Level of $\overline{ST}^2$ Yarns"

SOURCE: Shanghai FANGZHI GONGXUEYUAN XUEBAO [JOURNAL OF SHANGHAI COLLEGE OF TEXTILE TECHNOLOGY] in Chinese Vol 6 No 1, Mar 80 pp 12-20

TEXT OF ENGLISH ABSTRACT: The self-twisting yarn made by passing through two twisting units mounted on one machine, i.e., $\overline{ST}^2$ yarn, have the advantage of being used directly for knitting without additional twisting process. The theoretical analysis of this type of self-twisting process is rather complex and has not yet been reported.

In this paper, a theoretical approach to analyze the twist distribution in different zones has been attempted and separate differential equations have been derived. In order to relate the mutual action between two consecutive twisting rollers, the idea of yarn phase is introduced in addition to the machine phase

[Continuation of FANGZHI GONGXUEYUAN XUEBAO Vol 6 No 1, Mar 80 pp 12-20]

between these rollers. The criterion for maximum twist of the yarn produced or its best value can thus be calculated. Experiments on 3-ply self-twist yarn were carried out, and their results seem practically coincidal with theoretical calculations.

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LIANG Jinru [2733 6855 5423]
YAO Meiyun [1202 5019 0061]

ORG: None

TITLE: "Measurement and Analysis of the Twist Distribution in Cotton OE Yarn Cross Section. Part I: A Study on the OE Yarn Twist Problems"

SOURCE: Shanghai FANGZHI GONGXUEYUAN XUEBAO [JOURNAL OF SHANGHAI COLLEGE OF TEXTILE TECHNOLOGY] in Chinese Vol 6 No 1, Mar 80 pp 21-30

TEXT OF ENGLISH ABSTRACT: This paper is presented as the first part of the basic study on the OE yarn twist problems, with its emphasis focuses on the amount and distribution of twist in the cotton OE yarn cross section. A number of large-scale and systematic tests are conducted herein under the various conditions on the amount of twist in the cotton OE yarn cross section by means of a described tracer fiber method. In so doing, the relationships between the number of cotton yarn tex, the twist multiplier in metric system, the centrifugal force of the yarn and the effect of false twist of the funnel, on the one hand, and the amount and distribution of twist in different segments of the OE yarn cross section on the other, have been established. On this basis, a regressive equation of the relations between the four variable factors as mentioned

[Continuation of FANGZHI GONGXUEYUAN XUEBAO Vol 6 No 1, Mar 80 pp 21-30]

above and the designed twist as well as the practical twist of OE yarns are indicated. With this equation it is possible to find out the practical twist of OE yarns directly from the four factors under the actual spinning conditions and the designed twist of these yarns. At the same time, the standard for proper representation of the OE yarn twist is also obtained by actually measuring the twist in OE yarn cross sections.

This paper is intended to form a foundation for further studies on the measuring device of the OE yarn twist, with a view to accomplishing the instrumentation in production.

AUTHOR: YANG Shantong [2799 0810 0681]

ORG: None

TITLE: "A Theoretical Approach To and Experimental Investigation of Cam-Needle Impact Action"

SOURCE: Shanghai FANGZHI GONGXUEYUAN XUEBAO [JOURNAL OF SHANGHAI COLLEGE OF TEXTILE TECHNOLOGY] in Chinese Vol 6 No 1, Mar 80 pp 31-44

TEXT OF ENGLISH ABSTRACT: Part I The Basic Equations

Some basic equations, which may be used to describe and analyze the impact action of a linear cam on the needle in the whole acting zone, are derived by applying the fundamental theory of vibration of single-degree-of-freedom system, based on the hypotheses for simplifying the important parameter--the transverse stiffness of the needle. In general, the whole acting zone of a linear cam may be divided into:

1. The impact zone, in which the first impact and several re-impacts occur. The peak value of first impact force is equal to the sum of the resistance force to the needle and the amplitude of vibration, which is directly proportional to the velocity, the frequency and the mass of the needle. The re-impact force may be considered from the same point of view as the first impact, but a decrement

[Continuation of FANGZHI GONGXUEYUAN XUEBAO Vol 6 No 1, Mar 80 pp 31-44]

factor q must be taken into account, which is determined by the initial longitudinal velocity of the needle when it begins to re-impact with the cam. The intermittent time between the impacts is directly proportional to the longitudinal velocity of the needle and inversely proportional to the frictional resistance force.

2. The steady zone. The acting force on the needle in this zone is equal to the sum of the damping and frictional resistance force.

A typical model of the oscillogram of a linear cam acting force on the needle is also given in this paper.

Part II Experiments and Conclusions

A lot of experiments with various kinds of needles, cams and some different velocities have been made for investigating the actual impact action of a linear cam on a needle in the whole acting zone. The results of these experiments show that the basic equations in Part I used to explain the main characteristics of the linear cam impact action on the needle are reliable. Some of the data and photographs obtained in the experiments are illustrated in this paper as examples. Integrating the theoretical analyses with experimental investigations, interesting conclusions on the following items are obtained: typical model of

[Continuation of FANGZHI GONGXUEYUAN XUEBAO Vol 6 No 1, Mar 80 pp 11-44]

the oscillograms of the linear cam impact action on the needle, the peak value of the first impact force, the acting force in the steady zone, the re-impact force, the intermittent time between the first impact and the re-impact, the effects of the slope of the cam, and the horizontal velocity of the needle on the impact force, etc.

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ZHU Deming [2612 1795 2494]

ORG: None

TITLE: "Carding Force and Carding-Cleaning Action on a Stationary Flat Card"

SOURCE: Shanghai FANGZHI GONGXUEYUAN XUEBAO [JOURNAL OF SHANGHAI COLLEGE OF TEXTILE TECHNOLOGY] in Chinese Vol 6 No 1, Mar 80 pp 45-56

TEXT OF ENGLISH ABSTRACT: The carding forces of stationary flats on a minicard have been studied. A sensor was mounted on the flat being investigated. One or three of this kind of flat were placed on different positions in the working zone. As the strip of fillit clothing mounted on the sensor was as small as 1.1 cm^2, we assume that the carding forces to separate a tuft between the cylinder and flats can be measured. The force was recorded continuously by a light oscillograph.

It is found that the carding action of the flats in the back zone is mainly to open the tufts and that of the flats in the front zone is mainly to manipulate the single fibers and the tufts still remaining on the cylinder.

[Continuation of FANGZHI GONGXUEYUAN XUEBAO Vol 6 No 1, Mar 80 pp 55-56]

The fiber load on each flat varies with its position in the working zone and the following empirical formula is found to be applicable:

$$S = a \cdot P^b$$

where S: the fiber load on each flat,
P: the total amount of the fibers fed into the card during the running period,
a,b: constants.

The cleaning action of this kind of flat is also investigated and analyzed.

AUTHOR: YANG Xugang [2799 1645 0474]

ORG: None

TITLE: "Electron-Microscopic Examination of the Surface Morphological Structure of the Synthetic Fibers"

SOURCE: Shanghai FANGZHI GONGXUEYUAN XUEBAO [JOURNAL OF SHANGHAI COLLEGE OF TEXTILE TECHNOLOGY] in Chinese Vol 6 No 1, Mar 80 pp 57-62

TEXT OF ENGLISH ABSTRACT: The surface morphology of polyamide fibers, the morphological structure of the crimp region and the fracture morphology of the polyacrylonitrile fibers have been observed by using the transmission electron microscope and the scanning electron microscope. The characteristics of morphological structure of each specimen have been discussed. It is mentioned that if a process of steaming is added between the processes of spinning and stretching, the surface of the polyamide fibers would be rougher, and hence their friction coefficient would be decreased. It was observed that certain polyacrylonitrile fibers had lower molecular binding forces between the fibrils than ordinary polyacrylonitrile fibers, and this caused a marked decrease of the strength of such fibers after the crimping process. Finally, the article deals with the applicability of the two kinds of electron microscopy used in the experiment.

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TITLE: "An Analysis of the Sulzer Loom Gripper"

SOURCE: Shanghai FANGZHI GONGXUEYUAN XUEBAO [JOURNAL OF SHANGHAI COLLEGE OF TEXTILE TECHNOLOGY] in Chinese Vol 6 No 1, Mar 80 pp 63-68

TEXT OF ENGLISH ABSTRACT: The gripper of the sulzer loom (gripper shuttle loom) has a lower fatigue resistance than any other part of the machine. When properly heat-treated, correctly designed critical section of the gripper, and finally strengthened by shot-peening, its fatigue life can be raised from 200-300 thousand up to two million, while a figure of five million cycles or more has been reached in some cases.

Focusing their attention on the effects of stress, the authors have looked into the causes of and approaches to the raising of the fatigue life and made a preliminary analysis which has resulted in the establishment of a fatigue safety coefficient of the said gripper and has illustrated that the fatigue threshold stress intensity range (ΔK th) is raised two-fold, as described in the paper.

AUTHOR: YANG Sifang [2799 0843 5364]

ORG: None

TITLE: "The State-Space Calculation of Concord Brake of the Combined Printing and Dyeing Machine"

SOURCE: Shanghai FANGZHI GONGXUEYUAN XUEBAO [JOURNAL OF SHANGHAI COLLEGE OF TEXTILE TECHNOLOGY] in Chinese Vol 6 No 1, Mar 80 pp 69-74

TEXT OF ENGLISH ABSTRACT: The state space analysis is a recently developed method used to study dynamic states of systems. In this article, the state equation of concord brake of the combined printing and dyeing machine is derived and an example calculated from the above equation is provided.

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TITLE: "Determination of Sodium Methylallyl Sulfonate in Sodium Thiocyanate Solvent"

SOURCE: Shanghai FANGZHI GONGXUEYUAN XUEBAO [JOURNAL OF SHANGHAI COLLEGE OF TEXTILE TECHNOLOGY] in Chinese Vol 6 No 1, Mar 80 pp 81-87

TEXT OF ENGLISH ABSTRACT: Silver nitrate precipitation method in alkaline medium is adopted in the present paper to prevent interference from CNS$^-$, S^{2-}, SO$_3^{2-}$, etc. pH of filtrate is kept below 0.65 in order to avoid the reaction between sodium formate and iodine bromide (IBr). Then the iodine bromide halogenation method is used to determine quantitatively the content of the third monomer, i.e., sodium methylallyl sulfonate (SMAS) in the filtrate.

The method is simple in operation and has good data reproducibility. The NaSCN content in the solvent amounts of [illegible]0-52 percent and that of SMAS constitutes

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0.025-0.12 percent, while SMAS recovery ranges between 99.6 and 101.6 percent, with relative error not exceeding ±3 percent. This method is applicable to control analysis in polyacrylonitrile plants.

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TITLE: "A Brief Report of Native Multispindlecup-Type Spinning Frame with Automatic Yarn Count Regulation During Twisting"

SOURCE: Shanghai FANGZHI GONGXUEYUAN XUEBAO [JOURNAL OF SHANGHAI COLLEGE OF TEXTILE TECHNOLOGY] in Chinese Vol 6 No 1, Mar 80 pp 88-90

TEXT OF ENGLISH ABSTRACT: The report deals with the native multispindlecup-type spinning frame created long ago, but currently still in use in the villages of Zhejiang Province. The count of the spun yarn is automatically regulated during twisting by means of a tension device which can be adjusted by adding small weights. The working principles of the frame are quite different from modern spinning machines. It is another example illustrating the creative ability of the Chinese working people long ago. The exact date of the invention of this kind of frame remains to be ascertained.

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TITLE: "Structure and Sizing Properties of Acrylic Size"

SOURCE: Shanghai FANGZHI GONGXUEYUAN XUEBAO [JOURNAL OF SHANGHAI COLLEGE OF TEXTILE TECHNOLOGY] in Chinese Vol 6 No 1, Mar 80 pp 91-100

TEXT OF ENGLISH ABSTRACT: Due to its increasingly wide application, acrylic size has become one of the three principal sizes currently used. However, its quality control is often found as a knotty problem, and the sizing effect unstable.

This paper describes the variability of acrylic size structures and their chemical activities. It is proved by means of infrared absorption spectra that acrylic size is a polymer resulting from copolymerization of several monomers. Some factors relating to sizing properties are discussed and analyzed. Proper control of these factors will promote the stability of sizing liquor, which will make it possible to prepare the required optimum size.

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TITLE: "The Fracture Processes of the Tangshan Earthquake and Its Mechanical Analysis"

SOURCE: Beijing DIZHEN XUEBAO [ACTA SEISMOLOGICA SINICA] in Chinese Vol 2 No 2, May 80 pp 111-129

TEXT OF ENGLISH ABSTRACT: Fault-plane solutions of the mainshock and 17 large aftershocks are computed on the DJS-6 computer from the data of the first motions of P waves. Based on the model of finite moving source, the fracture processes and source parameters of the mainshock and three largest aftershocks

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are estimated. The mainshock occurred on a nearly vertical right-lateral strike-slip fault, striking N 30°E, with an asymmetric bilateral fracture which propagated 70 km northeastward and 45 km southwestward with an average velocity of 2.7 km/sec. Source parameters of the mainshock, such as the average dislocation, seismic moment and stress-drop, are estimated to be 136 cm, 1.24 x 10^{27} dyne cm and 12 bars respectively.

Most of the aftershocks with $M_L \geq 5.0$ occurred near the main fault plane and along the fracture branches at both of its ends. These fracture branches are located in the dilatational quarters and make about 80° angles with the main fault plane. On the two fracture branches, most of the major aftershocks are concentrated. A mechanical analysis of this phenomenon of fracture propagation is attempted in this paper.

It is shown that for complex deformations, the fracture propagation no longer takes place along the original plane for brittle materials, but deviates from it by a certain angle. The mechanical model used to calculate this deviation angle of fault yields results which agree essentially with the observation.

Based on the above results, it can be inferred that the characteristics and mechanical conditions of the Tangshan earthquake, as well as those of the

Haicheng earthquake, are quite different from those of the earthquakes occurring on some great faults which may be explained by stick-slip mechanisms. These two earthquakes are not only caused by the horizontal stress fields, but also by local vertical forces induced from the movement of the underground materials. It is also noteworthy that the Tangshan earthquake differs from the Haicheng earthquake in that it occurs in a relatively homogeneous and brittle medium and therefore no foreshocks took place before the mainshock.

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TITLE: "Stress Variations in the Region Around Beijing and Tianjin Before and After the 1976 Tangshan Earthquake"

SOURCE: Beijing DIZHEN XUEBAO [ACTA SEISMOLOGICA SINICA] in Chinese Vol 2 No 2, May 80 pp 130-146

TEXT OF ENGLISH ABSTRACT: This paper deals with the variations of tectonic stress in the region around Beijing and Tianjin before the great Tangshan earthquake of 1976, based on the analysis of the continuously recorded data of over 600 small earthquakes which occurred during the last 20 years. Such variations are chiefly concerned with the horizontal stress, indicating compression in the east-west direction and extension in the north-south. It is essentially consistent with the results from the earthquake source mechanism solution and the results of field macroscopic observations of the main Tangshan earthquake. The variations lasted for four and one-half years and recovered to the original state after the great earthquake.

Through an analysis of the stress variations, the spatial distribution of the seismic activity of small earthquakes of $M \geqslant 3.0$ occurred in this region and

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their source mechanism solutions, the relation between the stress concentration and the fault activity before the Tangshan earthquake has been discussed. It can be shown that before the earthquake the strain energy was concentrated at the northern end of the Cangdong fault belt and it was released for the first time during the last several decades, which reflects the background for the occurrence of the Tangshan earthquake.

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TITLE: "Directions of Tectonic Stress and Solutions of Earthquake Source Mechanisms"

SOURCE: Beijing DIZHEN XUEBAO [ACTA SEISMOLOGICA SINICA] in Chinese Vol 2 No 2, May 80 pp 147-152

TEXT OF ENGLISH ABSTRACT: The relations among the radiation pattern of seismic waves, focal mechanism solution and the directions of the tectonic stress are investigated with the aid of the results of two-dimensional model experiments. The radiation pattern of seismic waves is dependent on the form of motion of the medium around the focus at the time of the earthquake, which is connected not only with the pre-existing stress before the earthquake but also with other factors, such as the geological conditions within the focal region. Based on the experimental results of rock mechanics as well as the results of

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our experiments, it can be assumed that the direction of the principal compressive tectonic stress is closer to the fault plane than the direction of the principal compressive stress of release deduced from the focal mechanism solution.

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TITLE: "Some Features of Earthquake Distribution Around Beijing and Crustal Buckling"

SOURCE: Beijing DIZHEN XUEBAO [ACTA SEISMOLOGICA SINICA] in Chinese Vol 2 No 2, May 80 pp 153-168

TEXT OF ENGLISH ABSTRACT: The large spatial distribution of the activity of strong earthquakes is a characteristic feature. It seems that the worldwide seismic zones are somehow arranged in several regular directions on the spherical surface. We suppose that the cause of earthquakes might be related to the movements of the whole earth.

A feature relating to earthquake activity in blocks, the boundaries of which usually make a 45° angle with the latitude or longitude, was found. The same situation happened before strong earthquakes occurred in recent years. A stripe making an angle of 45° with the latitude or longitude has been delineated. Strong earthquakes occurring in recent years are located essentially along the

two boundary lines of this stripe, and obviously distribute themselves at an equidistant span, which means that the distance of the span between the strong earthquakes resembles an equal wave length during the folding of geological strata. We have studied all the M 8 earthquakes which have occurred in China throughout history. We have found that before or after each earthquake (M 8), another earthquake (M 7.5) generally occurred at a definite distance away. The distance span has two predominant distributions, one at a shorter distance of 480-550 km, the other at a longer distance of about 1100 km (the latter distance is about twice the former).

For a preliminary discussion we take the buckling process of a simple cylindrical shell under compression in the axial direction. From analysis we know that, when the cylindrical shell buckles, the buckling wave length $\left(\frac{1}{2}\lambda = 1.72\sqrt{Rh}\right.$, was determined only by the radius of the cylinder and the thickness of the shell. Now if we substitute R=6000 km; h=15 km, the halfwave length will be 530 km. It agrees with the distance span for strong earthquake distribution.

Therefore, we have the tentative opinion that the character of earthquake distribution is controlled by crustal buckling.

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TITLE: "Stress Deformation and Tilt Fields of the Earthquake Sources"

SOURCE: Beijing DIZHEN XUEBAO [ACTA SEISMOLOGICA SINICA] in Chinese Vol 2 No 2, May 80 pp 169-185

TEXT OF ENGLISH ABSTRACT: In this paper, from the point of view of the action of horizontal tectonic stress, the author has investigated the stress, deformation and tilt fields of the earthquake sources and derived the formulas to evaluate the seismic moment and magnitude from the vertical deformation data. The results agree with the observational data rather well.

Finally, the seismo-tectonic conditions for the occurrence of strong earthquakes and the credibility and generality of the elastic rebound theory has also been discussed.

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TITLE: "Ten Examples of Changes in Earth-Resistivity Prior to Strong Earthquakes"

SOURCE: Beijing DIZHEN XUEBAO [ACTA SEISMOLOGICA SINICA] in Chinese Vol 2 No 2, May 80 pp 186-197

TEXT OF ENGLISH ABSTRACT: In addition to the 1976 Tangshan earthquake, 10 more examples of changes in earth-resistivity (ρ_s) prior to strong earthquakes, five of which had magnitudes $M \geq 6$, are given in this paper. There are always at least two earth-resistivity recording stations located around the epicentral area of each of the earthquakes, recording the changes of ρ_s values quite in accord with each other. For some of the earthquakes, also given are data of repeated base line surveys in the vicinity of some of the earth-resistivity stations for comparison.

In many cases, the earth-resistivity values of the shallow layers below the ground surface decrease prior to the earthquakes, just as in the case of the Tangshan earthquake. However, in a number of cases they increase or vary

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irregularly. The purpose of this paper is merely to provide an accumulation of more such observed phenomena of earth-resistivity changes around epicentral areas before and after strong earthquakes. This is because observations of earth-resistivity changes at stations before and during strong earthquakes are a rare opportunity so far as such observations carried out in earthquake regions of the whole world are concerned, despite the fact that such observed changes in earth-resistivity are restricted to very shallow layers of the ground.

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TITLE: "Experimental Results of Radon and Thorium Emanations from Rock Specimens Under Pressure"

SOURCE: Beijing DIZHEN XUEBAO [ACTA SEISMOLOGICA SINICA] in Chinese Vol 2 No 2, May 80 pp 198-204

TEXT OF ENGLISH ABSTRACT: This paper describes the continuation of the previous laboratory work on the observation of radon and thorium emanations from rock specimens under pressure. The equipment used in the experiment are nearly the same as before. The results show again the previous conclusion that the variation of radon content of underground water as a precursory phenomenon of strong earthquakes is related to the fracturing of rock medium. However, for local regions, the characters of rock fracturing, of rocks themselves and so on are quite different so that the anomalous behavior of the variation of radon content before and after a strong earthquake may be quite different.

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TITLE: "Earth Tides and Seismic Waves Recorded by the Level Fluctuations in a Deep Borehole at Wali Near Beijing"

SOURCE: Beijing DIZHEN XUEBAO [ACTA SEISMOLOGICA SINICA] in Chinese Vol 2 No 2, May 80 pp 205-214

TEXT OF ENGLISH ABSTRACT: The water level in a deep borehole at Wali near Beijing may be used to record the tidal body-strain of the earth. After great earthquakes Rayleigh waves propagate around the earth's surface several times and cause the fluctuations of the water level in this borehole several times. Its high sensitivity in recording earth tides and seismic waves is believed to be due to the particular hydrogeological conditions.

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TITLE: "Some Relations Between Microbaromic Waves and Earthquakes (A Review)"

SOURCE: Beijing DIZHEN XUEBAO [ACTA SEISMOLOGICA SINICA] in Chinese Vol 2 No 2, May 80 pp 215-226

TEXT OF ENGLISH ABSTRACT: The long period of crustal movement prior to earthquakes has been noted for a long time. However, the problem of zerodrift of long period seismographs rendered the observations with such seismographs tentative or experimental in nature. In addition, when the underground gas spurts out and is set free before earthquakes, the observation of such gas can be made only near it and not too far away. The microbaromic waves, such as infrasonic and gravity waves caused by the gas outspurts and long period ground movements prior to earthquakes, may be detected at a distance, and thus should be studied.

Infrasound caused by seismic waves has been noticed long ago, but no report on infrasound before earthquakes has been made. After the 1976 Tangshan earthquake, from August 1976 to March 1977, the author observed microbaromic waves prior to aftershocks with a microbarograph at Beijing. More than 10 of these kinds of waves were observed. Their characteristics are as follows: the period is 40-

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80 seconds, sonic pressure 1-5 microbars, duration lasts a few minutes and they appeared 1-16 hours prior to the earthquakes.

In this paper, a method of analysis for recognizing microbaromic waves prior to earthquakes is developed. Its possible mechanism and other phenomena have been discussed.

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